High-Speed Analo
N-Channel DMOS FETs

SD211 / SD213 / SD215

FEATURES

- **High Input to Output Isolation** **120dB**
- **Low On Resistance** . . . . **30 Ohm**
- **Low Feedthrough and Feedback Transients**
- **Low Capacitance:**
  - **Input (Gate).** . . . . **2.4pF typ.**
  - **Output** . . . . **1.3pF typ.**
  - **Feedback** . . . . **0.3pF typ.**
- **Built-in Protection Diode from Gate to Substrate**

APPLICATIONS

SD211:
- **Analog Switch Driver**

SD213 and SD215:
- **Analog Switches**
- **High-Speed Digital Switches**
- **Multiplexers**
- **A to D Converters**
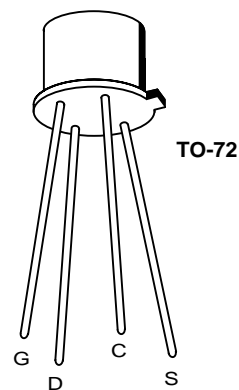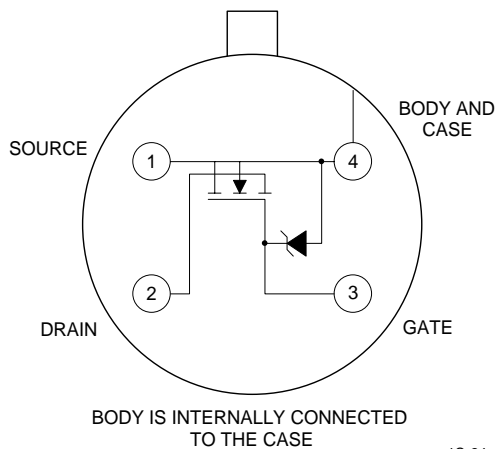- **D to A Converters**
- **Choppers**
- **Sample & Hold**

DESCRIPTION

The Calogic SD211 is a 30V analog switch driver with built-in protection diode from gate to substrate The SD211 is used with SD213 and SD215 DMOS analog switches.

ORDERING INFORMATION

Part	Package	Temperature Range
SD211E	Hermetic TO-72 Package	-55°C to +125°C
XSS211	Sorted Chips in Carriers	-55°C to +125°C
SD213DE	Hermetic TO-72 Package	-55°C to +125°C
XSD213	Sorted Chips in Carriers	-55°C to +125°C
SD215DE	Hermetic TO-72 Package	-55°C to +125°C
XSD215	Sorted Chips in Carriers	-55°C to +125°C

SCHEMATIC DIAGRAM (Top View)

SOURCE
BODY AND CASE
DRAIN
GATE
BODY IS INTERNALLY CONNECTED TO THE CASE
1Q-24
TO-72
G D C S

CD1-1

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SD211 / SD213 / SD215

calogic CORPORATION

ABSOLUTE MAXIMUM RATINGS

Drain Current 50mA
Total Device Dissipation at 25°C Case Temperature . . . 1.2W
Storage Temperatue Range . . . . -65°C to +200°C
Lead Temperature (1/16" from case for 10 sec.) . . . . . . 300°C
Operating Temperature Range . . . . -55°C to +125°C

	PARAMETER	SD211	SD212	SD215	UNIT
V_{DS}	Drain-to-Source	+30	+10	+20	V_{dc}
V_{SD}	Source-to-Drain	+10	+10	+20	V_{dc}
V_{DB}	Drain-to-Body	+30	+15	+25	V_{dc}
V_{SB}	Source-to-Body	+15	+15	+25	V_{dc}
V_{GS}	Gate-to-Source	-15 +25	-15 +25	-25 +30	V_{dc}
V_{GB}	Gate-to-Body	-0.3 +25	-0.3 +25	-0.3 +30	V_{dc}
V_{GD}	Gate-to-Drain	-30 +25	-15 +25	-25 +30	V_{dc}

DC CHARACTERISTICS (T_A = 25°C, unless otherwise specified)

SYMBOL	PARAMETER	SD211 MIN	SD211 TYP	SD211 MAX	SD213 MIN	SD213 TYP	SD213 MAX	SD215 MIN	SD215 TYP	SD215 MAX	UNITS	TEST CONDITIONS
BREAKDOWN VOLTAGE												
BV_{DS}	Drain-to-Source	30	35								V	$V_{GS} = V_{BS} = 0V$, $I_D = 10\mu A$
		10	25		10	25		20	25			$V_{GS} = V_{BS} = -5V$, $I_S = 10nA$
BV_{SD}	Source-to Drain	10			10			20				$V_{GD} = V_{BD} = -5V$, $I_D = 10nA$
BV_{DB}	Drain-to-Body	15			15			25				$V_{GB} = 0V$, source OPEN, $I_D = 10nA$
BV_{SB}	Source-to-Body	15			15			25				$V_{GB} = 0V$, drain OPEN, $I_S = 10\mu A$
LEAKAGE CURRENT												
I_{DS} (OFF)	Drain-to-Source		1	10		1	10				nA	$V_{GS} = V_{BS} = -5V$, $V_{DS} = +10V$
									1	10		$V_{GS} = V_{BS} = -5V$, $V_{DS} = +20V$
I_{SD} (OFF)	Source-to-Drain		1	10		1	10					$V_{GS} = V_{BD} = -5V$, $V_{SD} = +10V$
									1	10		$V_{GS} = V_{BD} = -5V$, $V_{SD} = +20V$
I_{GBS}	Gate			10			10			10		$V_{DB} = V_{SB} = 0V$, $V_{GS} = \pm 40V$
V_T	Threshold Voltage	0.5	1.0	2.0	0.1	1.0	2.0	0.1	1.0	2.0	V	$V_{DS} = V_{GS} = V_T$, $I_S = 1\mu A$, $V_{SB} = 0V$
r_{DS} (ON)	Drain-to-Source Resistance		50	70		50	70		50	70	Ω	$I_D = 1.0mA$, $V_{SB} = 0$, $V_{GS} = +5V$
			30	45		30	45		30	45		$I_D = 1.0mA$, $V_{SB} = 0$, $V_{GS} = +10V$
			23			23			23			$I_D = 1.0mA$, $V_{SB} = 0$, $V_{GS} = +15V$
			19			19			19			$I_D = 1.0mA$, $V_{SB} = 0$, $V_{GS} = +20V$
									17			$I_D = 1.0mA$, $V_{SB} = 0$, $V_{GS} = +25V$

AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	SD211 MIN	SD211 TYP	SD211 MAX	SD213 MIN	SD213 TYP	SD213 MAX	SD215 MIN	SD215 TYP	SD215 MAX	UNITS	TEST CONDITIONS
gfs	Forward Transconductance	10	15		10	15		10	15		ms	$V_{DS} = 10V$, $V_{SB} = 0V$, $I_D = 20mA$, $f = 1kHz$
SMALL SIGNAL CAPACITANCES												
C_{ISS}	Gate Node		2.4	3.5		2.4	3.5		2.4	3.5	pF	$V_{DS} = 10V$, $f = 1MHz$ $V_{GS} = V_{BS} = -15V$
C_{OSS}	Drain Node		1.3	1.5		1.3	1.5		1.3	1.5		
C_{RSS}	Source Node		0.3	0.5		0.3	0.5		0.3	0.5		