calogic
CORPORATION

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**

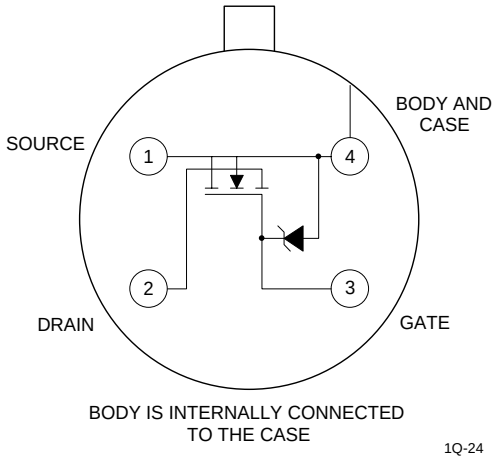
DESCRIPTION

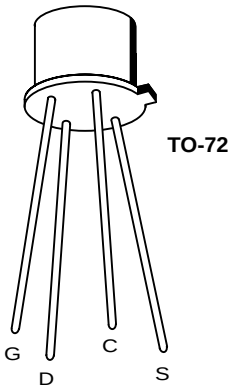
The Calogic SD211 is a 30V analog switch driver with built-in protection diode from gate to substrate The SD211 is used with SD213 and SD215 DMOS analog switches.

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)





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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			SD213			SD215			UNITS	TEST CONDITIONS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
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			SD213			SD215			UNITS	TEST CONDITIONS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
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		

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