

SD217 / SD219

FEATURES

- 25V Minimum Voltage
- 2 nsec Rise Time
- TTL & CMOS Compatible Input
- Low ON Resistance 5 Ohm
- Low Capacitances
- Peak Pulsed Current 1Amp min.
- Small Package, Standard Pin-Out
- Built-in Protection Diode

APPLICATIONS

- High-Speed, Medium-Power Analog Switch Drivers
- Multiplexers
- A to D and D to A Converters
- Choppers
- Sample & Hold & Track & Hold

SD217

- $\pm 7.5V$ Analog Switch

SD219

- $\pm 10V$ Analog Switch

DESCRIPTION

The Calogic SD217/SD219 are high-speed, medium-power analog switches and switch drivers with a built-in protection diode from gate to substrate. Both devices have low ON resistance of 6 Ohm maximum (at $V_{GS} = 10V$) and are capable of switching peak currents of 1 Amp.

The SD217 is a low resistance analog switch capable of switching $\pm 7.5V$ signals. The maximum threshold of 2V permits simple direct TTL and CMOS driving for small signal applications.

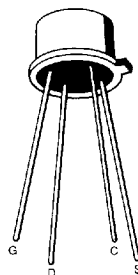
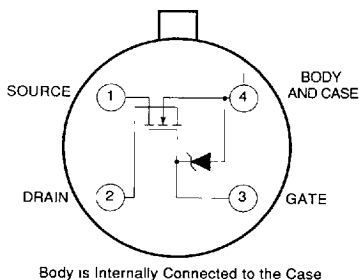
The SD219 is a low resistance analog switch capable of switching $\pm 10V$ signals. The maximum threshold of 2V permits simple direct TTL and CMOS driving for small signal applications.

Both devices are manufactured with an implanted high-speed, high-voltage and low resistance lateral double-diffused MOS (DMOS) process. The devices are available in 4-lead hermetic TO-72 package and in die form for hybrid applications. Custom devices based on SD217 and SD219 can also be ordered.

ORDERING INFORMATION

Part	Package	Temperature Range
SD217DE	Hermetic TO-72 Package	$-55^{\circ}C$ to $+125^{\circ}C$
XSD217	Sorted Chips in Carriers	$-55^{\circ}C$ to $+125^{\circ}C$
SD219DE	Hermetic TO-72 Package	$-55^{\circ}C$ to $+125^{\circ}C$
XSD219	Sorted Chips in Carriers	$-55^{\circ}C$ to $+125^{\circ}C$

Schematic Diagram (Top View)



CD3

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ABSOLUTE MAXIMUM RATINGS(T_A = +25°C unless otherwise specified)

V _{DS}	Drain-Source Voltage	+25V	I _D	Continuous Drain Current (Note 1)	160mA
V _{DB}	Drain-Body Voltage		P _D	Continuous Power Dissipation (Note 1)	
	SD217	+22.5V		T _A = +25°C (Free Air)	300mW
	SD219	+25V		T _C = +25°C (Infinite Heat Sink)	1.2W
V _{SD}	Source-Drain Voltage			Power Derating Factors (Note 1)	
	SD217	+15V		Free Air	3.0mW/°C
	SD219	+20V		Infinite Heat Sink	12mW/°C
V _{SB}	Source-Body Voltage			Thermal Resistance (Note 1)	
	SD217	+22.5V	O _{ja}	Junction to Ambient	333°C/W
	SD219	+25V	O _{jc}	Junction to Case	83°C/W
V _{GB}	Gate-Body Voltage	+30V	T _{op}	Temperature Range	-55°C to +125°C
V _{GS}	Gate-Source Voltage	±22.5V	T _{stg}	Storage Temperature Range	-55°C to +150°C
V _{GD}	Gate-Drain Voltage	±22.5V			
I _D	Peak Pulsed Drain Current	+1.0A			

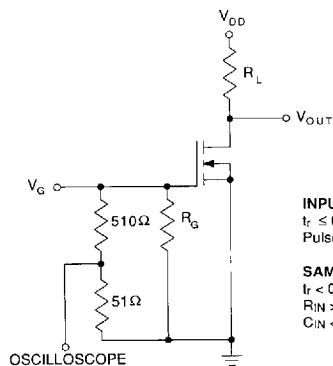
Note 1: Not applicable to chips. Final value depends on mounting**ELECTRICAL CHARACTERISTICS** (T_A = +25°C unless otherwise specified)

CHARACTERISTICS		MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
BV _{DS}	Drain-Source Breakdown Voltage	25	30		V	I _D = 10μA, V _{GS} = V _{BS} = 0
		15	20		V	I _D = 100nA, V _{GS} = V _{BS} = -5V
BV _{SD}	Source-Drain Breakdown Voltage	15			V	I _S = 100nA, V _{GD} = V _{BD} = -5V
	SD219	20				
BV _{DB}	Drain-Body Breakdown Voltage	22.5			V	I _D = 100nA, V _{GB} = 0, Source Open
	SD219	25				
BV _{SB}	Source-Body Breakdown Voltage	22.5			V	I _S = 100nA, V _{GB} = 0, Drain Open
	SD219	25				
I _{D(off)}	Drain-Source OFF Leakage Current			100	nA	V _{DS} = 15V, V _{GS} = V _{BS} = -5V
I _{S(off)}	Source-Drain OFF Leakage Current			100	nA	V _{SD} = 15V, V _{GD} = V _{BD} = -5V
I _{GB}	Gate-Body ON Leakage Current			10	μA	V _{GB} = 30V, V _{GS} = V _{GD} = 22.5V
V _{GS(th)}	Gate-Source Threshold Voltage	0.1		2.0	V	V _{DS} = V _{GS} , I _D = 10μA, V _{SB} = 0
I _{D(on)}	Drain-Source ON Current (Note 1)	1.0			A	V _{DS} = V _{GS} = 10V, V _{SB} = 0
r _{DS(on)}	Drain-Source ON Resistance (Note 1)			7.5 5.0	ohms ohms	V _{GS} = 5.0V, I _D = 50mA, V _{SB} = 0 V _{GS} = 10V, I _D = 500mA, V _{SB} = 0
g _{fs}	Common-Source (Note 1) Forward Transconductance	100			mS	V _{DS} = 15V, I _D = 200mA, V _{SB} = 0, F = 1kHz
C _(gs + gd + gb)	Gate Node Capacitance			30	pF	V _{DS} = 10V, V _{GS} = V _{BS} = -15V, f = 1MHz
C _(gd + db)	Drain-Node Capacitance			15		
C _(gs + sb)	Source Node Capacitance			40		
C _(dg)	Reverse Transfer Capacitance			5.0		
t _{on}	Turn ON Time		2.0	3.0	nS	V _{DD} = 10V, V _{G(on)} = 10V, R _L = 133Ω, R _G = 51Ω
t _{off}	Turn OFF Time		3.0	4.0	nS	

Note 1 Pulse Test 80μsec, 1% Duty Cycle

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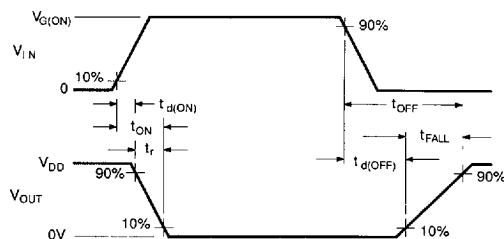
Switching Times Test Circuit



INPUT PULSE
 $t_r \leq 0.5\text{ns}$
 Pulse width = 100ns

SAMPLING SCOPE
 $t_r < 0.36\text{ns}$
 $R_{IN} > 1\text{M}\Omega$
 $C_{IN} < 2.0\text{pF}$

Test Waveforms



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