

T-35-25

# TOPAZ

SEMICONDUCTOR

## SD217, SD219

### N-CHANNEL ENHANCEMENT-MODE D-MOS POWER FET

#### ORDERING INFORMATION

TO-206AF (TO-72) Package	SD217DE	SD219DE
Shorting Ring	SD217DE/R	SD219DE/R
Sorted Chips in Waffle Pack	SD217CHP	SD219CHP
Description	6.0 ohm, 25V V <sub>SB</sub> = 15V min	6.0 ohm, 25V V <sub>SB</sub> = 20V min

#### FEATURES

- CMOS Compatible Input
- Small Package, Standard Pin-Out
- TTL and CMOS Compatible Input
- Low Capacitance
- Peak Pulsed Current, 1 Amp min

#### APPLICATIONS

- ± 10V Analog Switch, SD219DE
- ± 7.5 Analog Switch, SD217DE
- High Speed, Medium Power, Switch Drivers
- Sample and Hold and Track and Hold
- A-to-D and D-to-A Converters

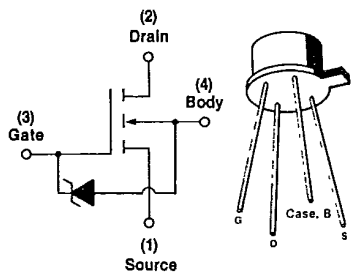
#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = + 25°C unless otherwise specified)

V <sub>DS</sub> Drain-Source Voltage	+ 25V
V <sub>DB</sub> Drain-Body Voltage	
SD217	+ 22.5V
SD219	+ 25V
V <sub>SD</sub> Source-Drain Voltage	
SD217	+ 15V
SD219	+ 20V
V <sub>SB</sub> Source-Body Voltage	
SD217	+ 22.5V
SD219	+ 25V
V <sub>GB</sub> Gate-Body Voltage	+ 30V
V <sub>GS</sub> Gate-Source Voltage	± 22.5V
V <sub>GD</sub> Gate-Drain Voltage	± 22.5V
I <sub>D</sub> Peak Pulsed Drain Current	+ 1.0A

I <sub>D</sub> Continuous Drain Current (Note 1)	160mA
P <sub>D</sub> Continuous Power Dissipation (Note 1)	
T <sub>A</sub> = + 25°C (Free Air)	300mW
T <sub>C</sub> = + 25°C (Infinite Heat Sink)	1.2W
Power Derating Factors (Note 1)	
Free Air	3.0mW/°C
Infinite Heat Sink	12mW/°C
Thermal Resistance (Note 1)	
Junction to Ambient	333°C/W
Junction to Case	83°C/W
O <sub>ja</sub>	
O <sub>jc</sub>	
T <sub>op</sub> Operating Junction	
Temperature Range	-55 to + 125°C
T <sub>stg</sub> Storage Temperature Range	-55 to + 150°C

Note 1: Not applicable to chips. Final value depends on mounting.

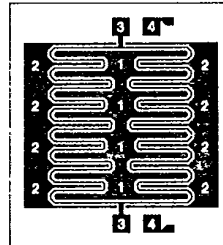
#### SCHEMATIC DIAGRAM



#### PACKAGE DIMENSIONS (TO-72) TO-206AF

(See Package 3)

#### CHIP CONFIGURATION



1—Drain 2—Source 3—Gate 4—Diode  
Minimum bonding required. One Drain, One Source (left), One Source (right), One Gate. Bond Gate and Adjacent Diode to Common Point to Connect Protective Diode.  
Size: .040 x .044 x .013 inch.  
Body (Substrate) is backside contact.



# SD217, SD219

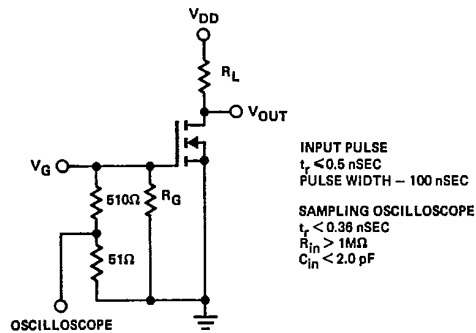
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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = +25 °C unless otherwise specified)

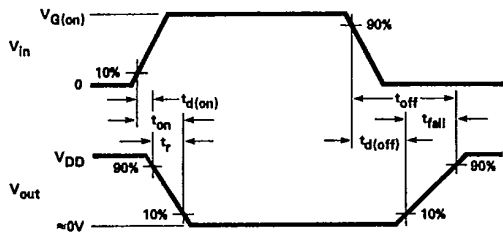
#	CHARACTERISTIC		MIN	TYP	MAX	UNITS	TEST CONDITIONS
1	BV <sub>DS</sub>	Drain-Source Breakdown Voltage	25	30		V	I <sub>D</sub> = 10μA, V <sub>GS</sub> = V <sub>BS</sub> = 0
2			15	20			I <sub>D</sub> = 100nA, V <sub>GS</sub> = V <sub>BS</sub> = -5V
3	BV <sub>SD</sub>	Source-Drain Breakdown Voltage	SD217: 15			V	I <sub>S</sub> = 100nA, V <sub>GD</sub> = V <sub>BD</sub> = -5V
4			SD219: 20				
5	BV <sub>DB</sub>	Drain-Body Breakdown Voltage	SD217: 22.5			V	I <sub>D</sub> = 100nA, V <sub>GB</sub> = 0, Source Open
6			SD219: 25				
7	BV <sub>SB</sub>	Source-Body Breakdown Voltage	SD217: 22.5			V	I <sub>S</sub> = 100nA, V <sub>GB</sub> = 0, Drain Open
8			SD219: 25				
9	I <sub>D(off)</sub>	Drain-Source OFF Leakage Current			100	nA	V <sub>DS</sub> = 15V, V <sub>GS</sub> = V <sub>BS</sub> = -5V
10	I <sub>S(off)</sub>	Source-Drain OFF Leakage Current			100		V <sub>SD</sub> = 15V, V <sub>GD</sub> = V <sub>BD</sub> = -5V
11	I <sub>GB</sub>	Gate-Body ON Leakage Current			10	μA	V <sub>GB</sub> = 30V, V <sub>GS</sub> = V <sub>GD</sub> = 22.5V
12	V <sub>GS(th)</sub>	Gate-Source Threshold Voltage	0.1		2.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 10μA, V <sub>SB</sub> = 0
13	I <sub>D(on)</sub>	Drain-Source ON Current (Note 1)	1.0			A	V <sub>DS</sub> = V <sub>GS</sub> = 10V, V <sub>SB</sub> = 0
14	r <sub>DS(on)</sub>	Drain-Source ON Resistance (Note 1)			8.0	ohms	V <sub>GS</sub> = 5.0V, I <sub>D</sub> = 50mA, V <sub>SB</sub> = 0
15					6.0		V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA, V <sub>SB</sub> = 0
16					6.0		
17	g <sub>fs</sub>	Common-Source (Note 1) Forward Transconductance	100			mmhos	V <sub>DS</sub> = 15V, I <sub>D</sub> = 200mA, V <sub>SB</sub> = 0, F = 1KHz
18	C <sub>(gs + gd + gb)</sub>	Gate Node Capacitance			30	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = V <sub>BS</sub> = -15V, f = 1MHz
19	C <sub>(gd + db)</sub>	Drain-Node Capacitance			15		
20	C <sub>(gs + sb)</sub>	Source Node Capacitance			40		
21	C <sub>(dg)</sub>	Reverse Transfer Capacitance			5.0		
22	t <sub>on</sub>	Turn ON Time		2.0	4.0		
23	t <sub>off</sub>	Turn OFF Time		3.0	5.0		

Note 1: Pulse Test 80μSec, 1% Duty Cycle

### SWITCHING TIMES TEST CIRCUIT



### TEST WAVEFORMS

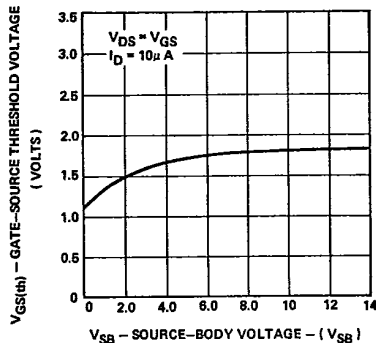




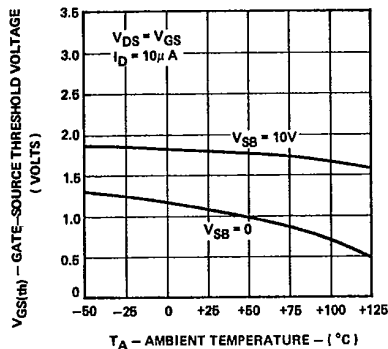
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SD217, SD219

**TYPICAL PERFORMANCE CHARACTERISTICS** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

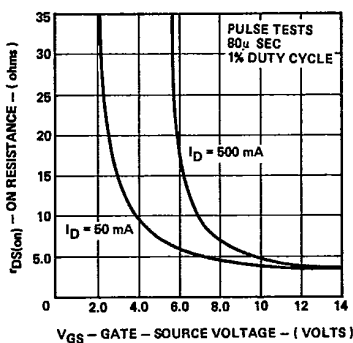
**GATE-SOURCE THRESHOLD VOLTAGE**  
—VS—  
**SOURCE-BODY VOLTAGE**



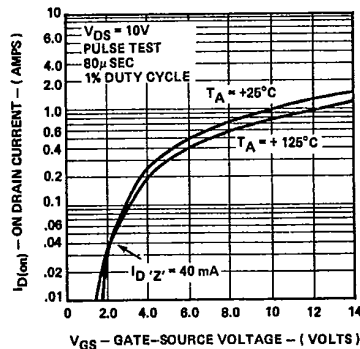
**GATE-SOURCE THRESHOLD VOLTAGE**  
—VS—  
**TEMPERATURE**



**DRAIN-SOURCE ON RESISTANCE**  
—VS—  
**GATE-SOURCE VOLTAGE**



**ON DRAIN CURRENT**  
—VS—  
**GATE-SOURCE VOLTAGE**



**FORWARD TRANSCONDUCTANCE**  
—VS—  
**ON DRAIN CURRENT**

