n-channel enhancement—mode lateral D-MOS FETs

Siliconix

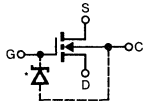
designed for Military and Industrial Applications . . .

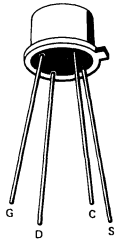
- **High Speed Switching**
- **Analog Switch**
- **Multiplexer**
- **Digital Switch**
- **A to D Converters**
- **D to A Converters**
- **Choppers**
- **Sample and Hold**

BENEFITS

- **High Speed Switching**
- **Ultra Low Feedback Capacitance**
- **Low $R_{DS(ON)}$**
- **Diode Protected Gate**

TO-72
See Section 6





ABSOLUTE MAXIMUM RATINGS (°C)

Drain Current ..... 50 mA
Total Device Dissipation at 25°C
Case Temperature 1.2W
Storage Temperature Range ..... −65° to +150°C
Lead Temperature
(1/16" from case for 10 sec)..... 300°C
Operating Temperature Range ..... −55° to +150°C

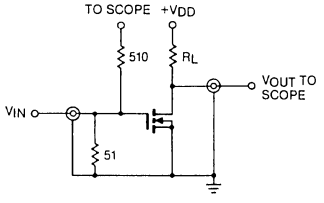
ELECTRICAL CHARACTERISTICS (25°C unless otherwise noted)

Characteristic—DC		Min	Typ	Max	Unit	Test Conditions
I_{GSS}	Gate Reverse Current		0.1	1	μA	V_{GS} = 20V, V_{DS} = V_{GS} = V_{BS} = 0
B_{VSD}	Breakdown Voltage Source to Drain	10			V	V_{GD} = V_{BD} = −5V, I_D = 1 μA
B_{VSB}	Breakdown Voltage Source to Body	10			V	I_S = 10 μA, V_{GB} = 0
B_{VDS}	Breakdown Voltage Drain to Source	15			V	V_{GS} = V_{BS} = 0V, I_D = 10 μA
$V_{GS(th)}$	Gate-Source Threshold Voltage	0.5		2 5	V	V_{DS} = V_{GS} = V_{th}, I_D = 10 μA
gfs	Common-Source Forward Transconductance	25	30		mmhos	V_{DS} = 15V, I_D = 20 mA, F = 1 KHz
$R_{DS(ON)}$	Drain to Source Resistance					I_D = 5 mA, V_{BS} = 0V
				18	Ω	V_{GS} = 5V
				12	Ω	V_{GS} = 10V
			8		Ω	V_{GS} = 15V
Characteristic—AC		**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**
Small Signal Capacitance						V_{DS} = 10V, V_{GS} = V_{BS} = −15V, f = 1 MHz
$C_{(GS+GD+GB)}$	Gate Mode			17	pF	
$C_{(GD+DS)}$	Drain Mode			7	pF	
C_{DG}	Reverse Transfer			2.5	pF	

SWITCHING CHARACTERISTICS

TEST CONDITIONS

Switching

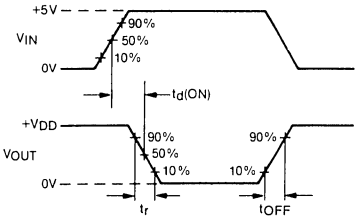


Input pulse t_d, t_r < 1ns
Pulse width = 100ns
Rep rate = 1MHz

SAMPLING SCOPE

t_r < 360ps
R_{IN} = 1MΩ
C_{IN} = 2.0pF

Typical Switching Waveform



SWITCHING CHARACTERISTICS

		td(ON) (ns)		tr(ns)		tOFF(ns)	
VDD	RL	Typ	Max	Typ	Max	Typ	Max
5	680	0.6	1.0	0.7	1.0	9.0	*
10	680	0.7		0.8		9.0	*
15	1k	0.9		1.0		14.0	*

*tOFF is dependent on R_L and C_L and does not depend on the device characteristics