

4-CHANNEL CMOS/DMOS HIGH-FREQUENCY MULTIPLEXER

FEATURES

- High OFF Isolation, >62dB @ 10 MHz
- Low Channel-to-Channel Crosstalk, >80dB @ 10 MHz
- 5 Volt CMOS Compatible Inputs
- Low ON Resistance, 40 Ω typ.
- Wide Bandwidth, -3.0dB @ 100 MHz
- Wide Analog Signal Range +10V to -10V
- High Speed Logic Control

APPLICATIONS

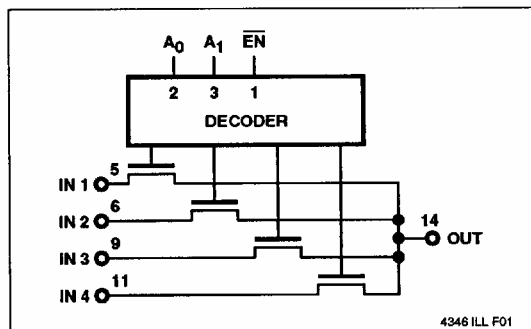
- RF & Video Switches
- High Speed Precision Data Acquisition

GENERAL DESCRIPTION

Teledyne CMOS/DMOS Analog Multiplexers feature high-speed, low-power 5 volt CMOS input logic and level translation circuitry and high speed, low capacitance Lateral DMOS switches. CMOS and Lateral DMOS circuitry are fabricated together on a single silicon chip. This part is designed for applications where high "off" isolation at high frequencies is needed. The 14 pin configuration gives a compact board layout without impacting "off" isolation and by use of the enable allows higher levels of multiplexing.

All devices contain diodes to protect inputs against damage due to high static voltages or electric fields; however, it is advised that precautions be taken not to exceed the maximum recommended input voltages. All unused inputs must be connected to an appropriate logic level (either V_{CC} or GND).

FUNCTION DIAGRAM



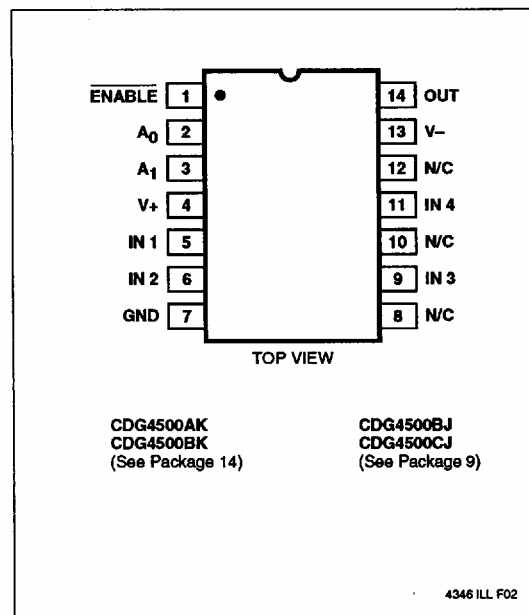
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FUNCTION TABLE

ENABLE	A ₀	A ₁	CHANNEL
H	X	X	OFF
L	L	L	S1
L	H	L	S2
L	L	H	S3
L	H	H	S4

X = Undefined

PIN CONFIGURATION



4346 ILL F02

CDG4500

ABSOLUTE MAXIMUM RATINGS

V ₋	Negative Supply Voltage	-20V
V ₊	Positive Supply Voltage	+20V
V _{IN}	Control Input Voltage	
	Range	V ₊ +0.3V, V ₋ -0.3V
I _L	Continuous Current, any Pin except S or D	20mA
I _S	Continuous Current, S or D	30mA
I _S	Peak Pulsed Current, S or D, 80μsec, 1% Duty Cycle	100mA
T _J	Junction Temperature Range	-55°C to +125°C
T _S	Storage Temperature Range	-55°C to +125°C
P _D	Power Dissipation (derate at 12mW/°C, above +85°C)	500mW

RECOMMENDED OPERATING CONDITIONS

V ₋	Negative Supply Voltage	-8.0 to -15V
V ₊	Positive Supply Voltage	+8.0 to +15V
V _{IN}	Control Input Voltage	0 to +5V
T _{OP}	Operating Temperature	
	(A Suffix)	-55 to +125°C
	(B Suffix)	-40 to +85°C
	(C Suffix)	0 to +70°C

Static-sensitive device. Unused devices must be stored in conductive material. Protect devices from static discharge and static fields. Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operation sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ORDERING INFORMATION

4-Channel Multiplexer with Enable	14-Pin Plastic DIP	14-Pin Ceramic DIP
Commercial Temp. Range	CDG4500 CPD	—
Industrial Temp. Range	CDG4500 EPD	CDG4500 EJD
Military Temp. Range	—	CDG4500 MJD

CDG4500

ELECTRICAL CHARACTERISTICS: ($V_- = -15V$, $V_+ = +15V$, per channel, unless otherwise noted, $T_A = +25^\circ C$)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static						
V_{ANALOG}	Analog Signal Range		-10		+10	V
$r_{DS(on)}$	Channel On Resistance	$V_S = -10V$ $V_S = +2.0V$ $V_S = +10V$	—	40 45 100	80 80 160	Ω
V_{IH}	Logic High Level Input Voltage		4.5	3.4	—	V
V_{IL}	Logic Low Level Input Voltage		—	—	1.0	V
I_{IN}	Logic Input Leakage Current	$V_{IN} = +5.0V$ $V_{IN} = +15V$	—	0.01 0.02	0.1 0.1	μA
$I_{D(OFF)}$ $I_{S(OFF)}$	Switch OFF Leakage Current	$V_D = +10V$, $V_S = -10V$ $V_S = +10V$, $V_D = -10V$	—	0.2 0.4	5.0 5.0	nA
I_-	Negative Supply Quiescent Current	$V_{IN} = 0$ or V_+	—	-1.4	-4.0	mA
I_+	Positive Supply Quiescent Current	$V_{IN} = 0$ or V_+	—	1.6	4.0	mA
Dynamic						
t_{ON}	Switch Turn-On Time (All inputs)	$V_{IN} = 5.0V$	—	150	250	nsec
t_{OFF}	Switch Turn-OFF Time (All inputs)	$V_{IN} = 5.0V$	—	120	220	nsec
C_{CRR}	All Crosstalk Single Channel Crosstalk Frequency Roll-Off (Bandwidth)	$f = 10$ MHz, $R_L = 50\Omega$ $f = 10$ MHz, $R_L = 50\Omega$ $f = 100$ MHz, $R_L = 50\Omega$	62 80 —	— — 1.0	— — 3.0	dB
C_d	Output Node Capacitance	$V_D = 0$, $f = 1$ MHz, $V_{IN} = 0$	—	8.0	12.0	pF
C_s	Input Node Capacitance	$V_S = 0$, $f = 1$ MHz, $V_{IN} = 0$	—	2.5	4.0	pF

ELECTRICAL CHARACTERISTICS: ($V_- = -15V$, $V_+ = +15V$, per channel, unless otherwise noted)

LIMITS AT TEMPERATURE EXTREMES

Symbol	Parameter	Test Conditions	MAXIMUM @ $T_A =$					Units
			-55°C	-40°C	+70°C	+85°C	+125°C	
Static								
V_{ANALOG}	Analog Signal Range		± 10	± 10	± 10	± 10	± 10	V
$r_{DS(on)}$	Channel On Resistance	$V_S = -10V$, $I_S = -1.0$ mA $V_S = +2.0V$, $I_S = +1.0$ mA $V_S = +10V$, $I_S = -1.0$ mA	80 80 160	80 80 160	120 120 240	120 120 240	150 150 300	Ω Ω Ω
I_{IN}	Logic Input Leakage Currents	$V_{IN} = +5.0V$ $V_{IN} = +15V$	0.1 0.1	0.1 0.1	1.0 2.0	1.0 2.0	10 20	μA
$I_{D(OFF)}$ $I_{S(OFF)}$	Switch OFF Leakage Currents	$V_D = +10V$, $V_S = -10V$ $V_S = +10V$, $V_D = -10V$	5.0 5.0	5.0 5.0	100 100	100 100	1000 1000	nA
I_-	Supply	$V_{IN} = 0$ or V_+	-4.0	-4.0	-4.0	-4.0	-4.0	mA
I_+	Quiescent Currents	$V_{IN} = 0$ or V_+	4.0	4.0	4.0	4.0	4.0	mA