

# CMOS/DMOS Wideband High-Frequency Multiplexer



## CWB4500

### FEATURES

- High OFF Isolation. . . . . > 62dB @ 10MHz
- Low Channel-to-Channel Crosstalk. . . > 80dB @ 10MHz
- TTL Capatible Inputs. . . . . 5V
- Low ON Resistance. . . . . 40ohm typical
- Wide Bandwidth. . . . . -3.0dB @ 100MHz
- High Speed Logic Control

### APPLICATIONS

- RF and Video Switching
- High Speed Precision Data Acquisition
- ATE

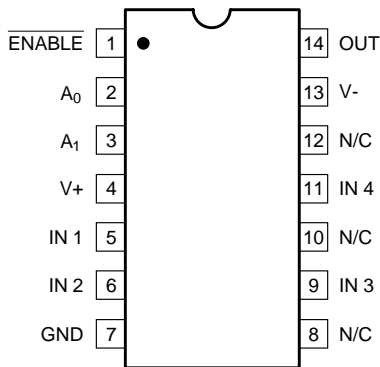
### DESCRIPTION

The CWB4500 is a very high performance Monolithic 4 Channel Wideband/Video Multiplexer designed for switching wide bandwidth analog and digital signals. The high speed, low ON resistance and low capacitance is achieved through Calogic's proprietary CMOS/DMOS process that combines low-power CMOS control logic with very fast DMOS switching FETs.

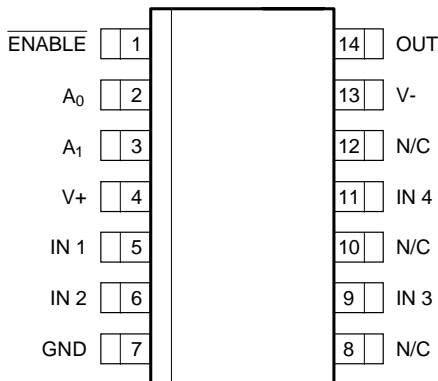
### ORDERING INFORMATION

Part	Package	Temperature Range
CWB4500CP	Plastic 14-Pin Dip	0 to +85°C
CWB4500CY	Plastic SO-14 Surface Mount	0 to +85°C
XCWB4500	Sorted Chips in Carriers	0 to +85°C

### PIN CONFIGURATION



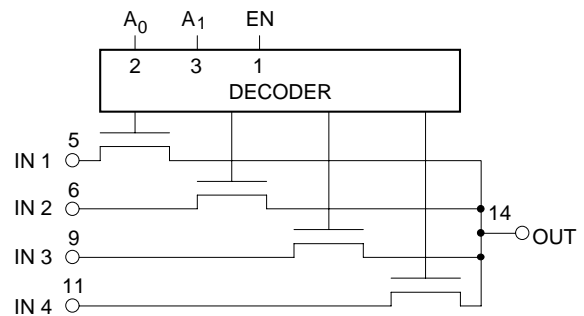
CWB4500CP



CWB4500CY

CWB

### FUNCTION DIAGRAM



### FUNCTION TABLE

ENABLE	A <sub>0</sub>	A <sub>1</sub>	CHANNEL
H	x	x	OFF
L	L	L	S <sub>1</sub>
L	H	L	S <sub>2</sub>
L	L	H	S <sub>3</sub>
L	H	H	S <sub>4</sub>

X = Undefined

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<sub>CC</sub> or GND).

**ABSOLUTE MAXIMUM RATINGS**

V-	Negative Supply Voltage	-20V
V+	Positive Supply Voltage	+20V
V <sub>IN</sub>	Control Input Voltage Range	V+ +0.3V V- -0.3V
I <sub>L</sub>	Continuous Current, any Pin except S or D	20mA
I <sub>S</sub>	Continuous Current, S or D	30mA
I <sub>S</sub>	Peak Pulsed Current, S or D, 80μsec, 1%, Duty Cycle	100mA
T <sub>J</sub>	Junction Temperature Range	-55 to +125°C
T <sub>S</sub>	Storage Temperature Range	-55 to +125°C
P <sub>D</sub>	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 <sub>IN</sub>	Control Input Voltage Range	0 to +5V
T <sub>OP</sub>	Operating Temperature	0 to 85°C

**ELECTRICAL CHARACTERISTICS** (V- = -15V, V+ = +15v unless otherwise noted, T<sub>A</sub> = +25°C)

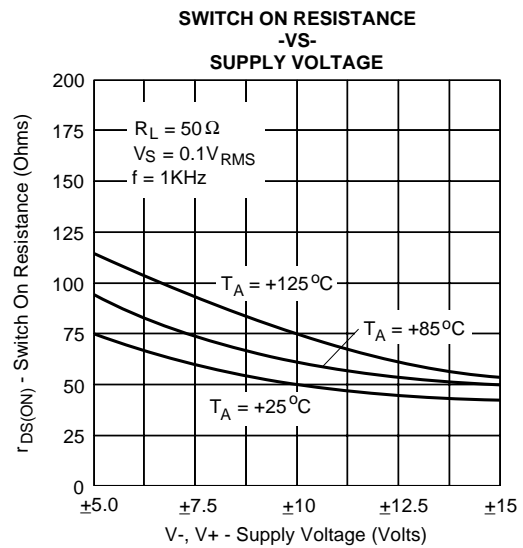
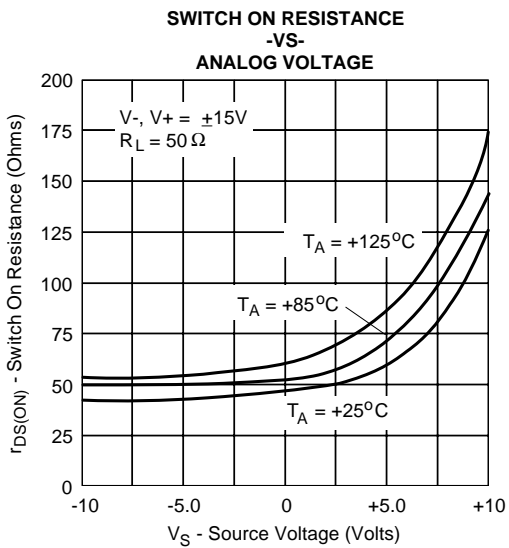
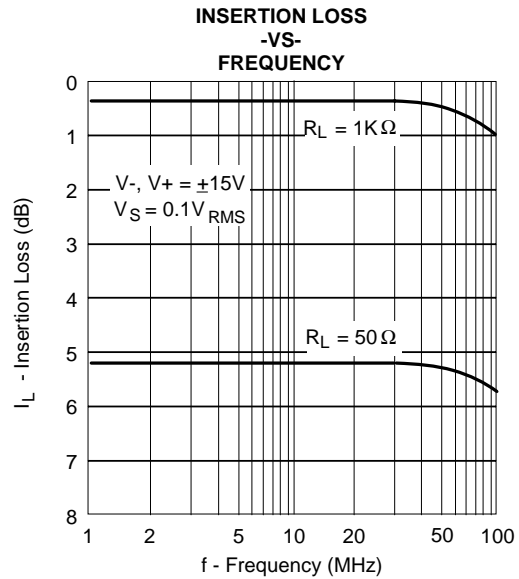
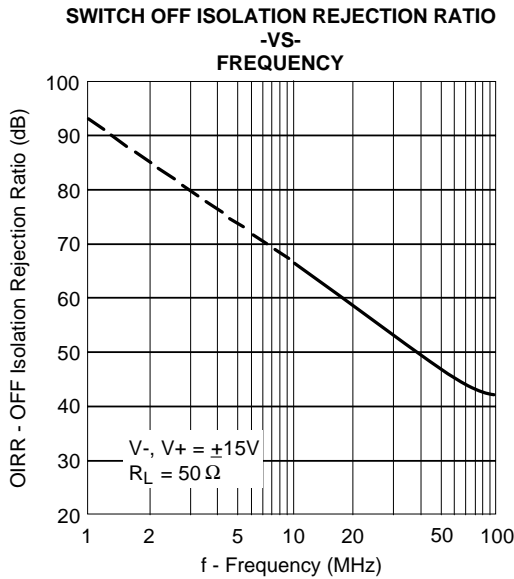
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>STATIC</b>						
V <sub>ANALOG</sub>	Analog Signal Range	-10		+10	V	
r <sub>DS(ON)</sub>	Channel ON Resistance		40	80	Ω	V <sub>S</sub> = -10V
			45	80		V <sub>S</sub> = +2.0V
			100	160		V <sub>S</sub> = +10V
V <sub>IH</sub>	Logic High Level Input Voltage	4.5	3.4		V	
V <sub>IL</sub>	Logic Low Level Input Voltage			1.0		
I <sub>IN</sub>	Logic Input Leakage Current		0.01	0.1	μA	V <sub>IN</sub> = +5.0V
				0.02		0.1
I <sub>D(OFF)</sub>	Switch OFF Leakage Current		0.2	5.0	nA	V <sub>D</sub> = +10V, V <sub>S</sub> = -10V
I <sub>S(OFF)</sub>			0.4	5.0		V <sub>S</sub> = +10V, V <sub>D</sub> = -10V
I-	Negative Supply Quiescent Current		-1.4	-4.0	mA	V <sub>IN</sub> = 0 or V+
I+	Positive Supply Quiescent Current		1.6	4.0		
<b>DYNAMIC</b>						
t <sub>ON</sub>	Switch Turn-ON Time (All inputs)		150	250	nsec	V <sub>IN</sub> = 5.0V
t <sub>OFF</sub>	Switch Turn-OFF Time (All inputs)		120	220		
C <sub>CRR</sub>	All Crosstalk	62			dB	f = 10MHz, R <sub>L</sub> = 50Ω
	Single Channel Crosstalk	80				
	Frequency Roll-OFF (Bandwidth)		1.0	3.0		
C <sub>d</sub>	Output Node Capacitance		8.0	12.0	pF	f = 1MHz, V <sub>IN</sub> = 0
C <sub>s</sub>	Input Node Capacitance		2.5	4.0		

**ELECTRICAL CHARACTERISTICS** (V- = -15V, V+ = +15V unless otherwise noted)

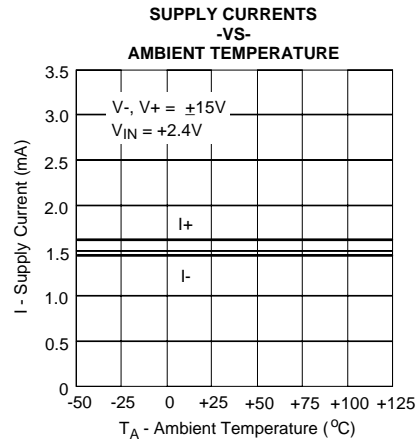
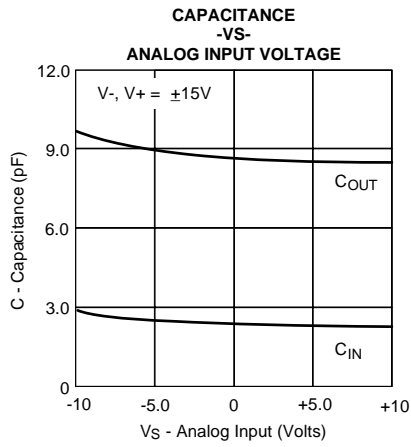
**LIMITS AT TEMPERATURE EXTREMES**

SYMBOL	PARAMETER	MAXIMUM @ T <sub>A</sub> =		UNITS	TEST CONDITIONS
		+85°C			
<b>STATIC</b>					
V <sub>ANALOG</sub>	Analog Signal Range	±10		V	
r <sub>DS(ON)</sub>	Channel ON Resistance	120		Ω	V <sub>S</sub> = -10V, I <sub>S</sub> = -1.0mA
		120			V <sub>S</sub> = +2.0V, I <sub>S</sub> = +1.0mA
		240			V <sub>S</sub> = +10V, I <sub>S</sub> = +1.0mA
I <sub>IN</sub>	Logic Input Leakage Current	1.0		μA	V <sub>IN</sub> = +5.0V
		2.0			V <sub>IN</sub> = +15V
I <sub>D(OFF)</sub>	Switch OFF Leakage Currents	100		nA	V <sub>D</sub> = +10V, V <sub>S</sub> = -10V
I <sub>S(OFF)</sub>		100			V <sub>S</sub> = +10V, V <sub>D</sub> = -10V
I-	Supply Quiescent Currents	-4.0		mA	V <sub>IN</sub> = 0 or V+
I+		4.0			

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



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





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