

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

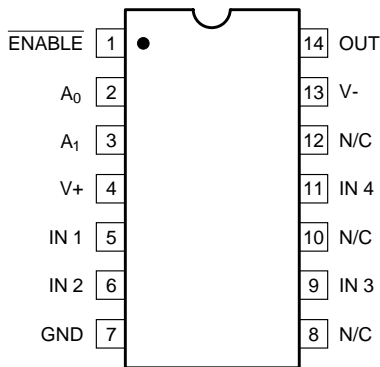
DESCRIPTION

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.

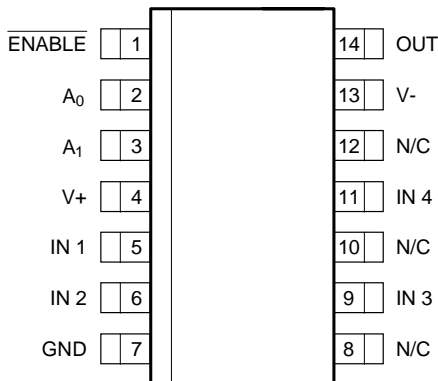
ORDERING INFORMATION

| 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



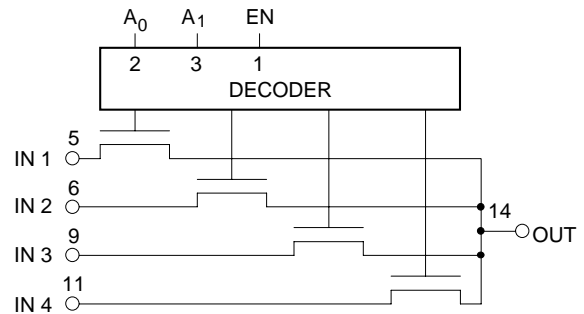
CWB4500CP



CWB4500CY

CWB

FUNCTION DIAGRAM



FUNCTION TABLE

| ENABLE | A ₀ | A ₁ | CHANNEL |
|--------|----------------|----------------|----------------|
| H | x | x | OFF |
| L | L | L | S ₁ |
| L | H | L | S ₂ |
| L | L | H | S ₃ |
| L | H | H | S ₄ |

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_{CC} or GND).

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 to +125°C |
| T _S | Storage Temperature Range | -55 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 Range | 0 to +5V |
| T _{OP} | Operating Temperature | 0 to 85°C |

ELECTRICAL CHARACTERISTICS (V₋ = -15V, V₊ = +15V unless otherwise noted, T_A = +25°C)

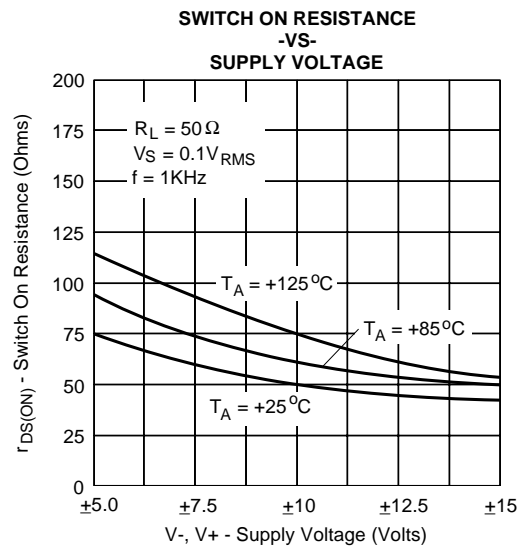
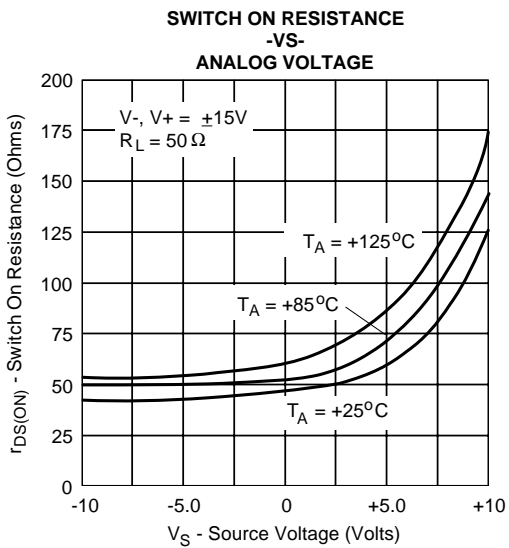
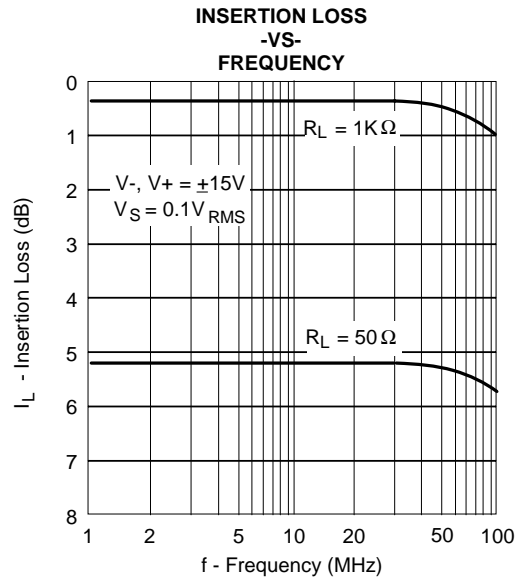
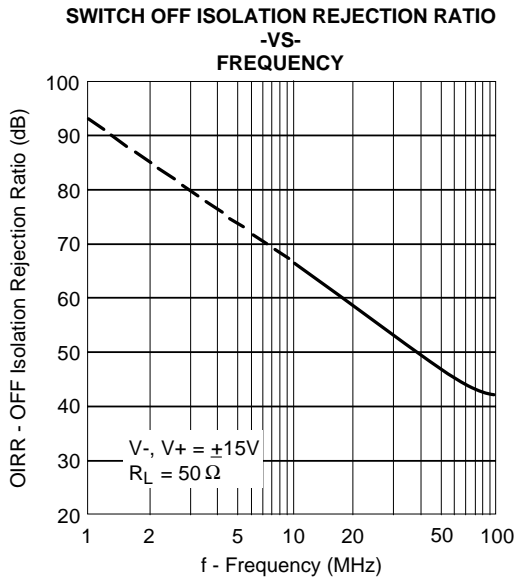
| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---------------------|-----------------------------------|-----|------|------|-------|--|
| STATIC | | | | | | |
| V _{ANALOG} | Analog Signal Range | -10 | | +10 | V | |
| r _{DS(ON)} | Channel ON Resistance | | 40 | 80 | Ω | V _S =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

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

LIMITS AT TEMPERATURE EXTREMES

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

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



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