

CMOS/DMOS High Speed Analog Switch



CWB2214

FEATURES

- High OFF Isolation. >40dB @ 100MHz
..... >25dB @ 200MHz
- Fast Switching
- CMOS Compatible Inputs
- Wide Bandwidth. -3dB @ 250MHz
- Low ON Resistance

APPLICATIONS

- RF and Video Switches
- High Frequency Data Acquisition
- High Frequency Multiplexing

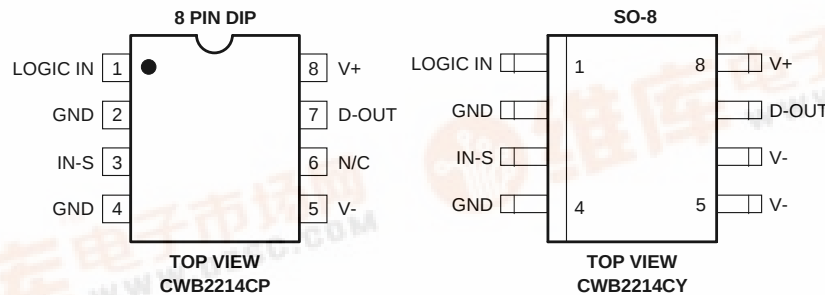
DESCRIPTION

The CWB2214 is a High Speed SPST Analog Switch designed utilizing Calogic's proprietary CMOS/DMOS processing techniques. The device features low-power CMOS input logic and level translation circuitry and high speed, low capacitance lateral DMOS switches fabricated together in a monolithic structure.

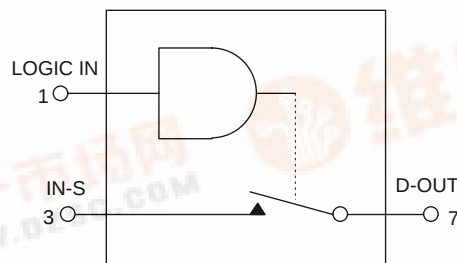
ORDERING INFORMATION

Part	Package	Temperature Range
CWB2214CP	Plastic 8-Pin Dip	0 to 85°C
CWB2214CY	Plastic SO-8	0 to 85°C
XCWB2214	Sorted Chips in Carriers	0 to 85°C

PIN CONFIGURATION



FUNCTIONAL DIAGRAM



One SPST Switch per Package.
Switch shown in Logic '1' Input Position.
Logic '0' $\leq 1.0V$
Logic '1' $\geq 4.5V$

NOTE: 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 (V_{DD} 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	40mA
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	-5 to -15V
V+	Positive Supply Voltage	+5 to +15V
V _{IN}	Control Input Voltage Range	0 to +5V
T _{OP}	Operating Temperature	0 to +85°C

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS	
STATIC							
V _{ANALOG}	Analog Signal Range	-10		+10	V		
r _{DS(ON)}	Switch ON Resistance		45	80	Ω	V _S = -10V	
			50	80		V _S = +2.0V	
			130	160		V _S = +10V	
V _{IH}	High Level Input Voltage	4.5	3.4		V		
V _{IL}	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		V _{IN} = +15V	
I _{D(OFF)}	Switch OFF Leakage Current		0.2	5.0	nA	V _D = +10V, V _S = -10V, V _{IN} = 5V	
I _{S(OFF)}			0.2	5.0		V _S = +10V, V _D = -10V, V _{IN} = 5V	
I ₋	Negative Supply Quiescent Current			-8.0	mA	V _{IN} = 0 or V+	
I ₊	Positive Supply Quiescent Current			8.0			
DYNAMIC							
t _{ON}	Switch Turn-ON Time		40	60	nsec	V _{IN} = 5.0V, R _L = 50Ω	
t _{OFF}	Switch Turn-OFF Time		20	40		C _L = 12pF	
O _{IRR}	OFF Isolation Rejection Ratio	37	40		dB	R _L = 50Ω	f = 100MHz
		22	25				f = 200MHz
I _L	Insertion Loss		7.8	13		R _L = 50Ω, f = 200MHz	
C _d	Drain-Node Capacitance		0.3		pF	V _D = 0	f = 1MHz, V _{IN} = 0
C _s	Source-Node Capacitance		3.0			V _S = 0	

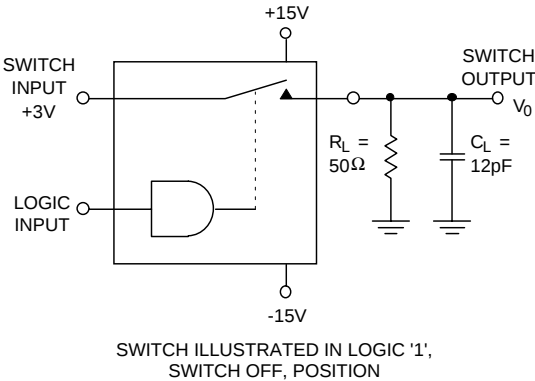
ELECTRICAL CHARACTERISTICS (V- = -15V, V+ = +15V unless otherwise noted)

LIMITS AT TEMPERATURE EXTREMES

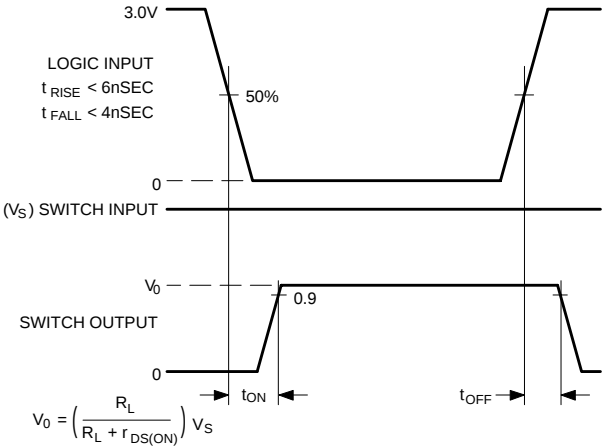
SYMBOL	PARAMETER	MAXIMUM TA @ TA =	UNITS	TEST CONDITIONS
		+85°C		
STATIC				
VANALOG	Analog Signal Range	±10	V	
rDS(ON)	Switch ON Resistance	120	Ω	VS = -10V
		120		VS = +2.0V
		240		VS = +10V
IIN	Logic Input Leakage Current	1.0	μA	VIN = +5.0V
		2.0		VIN = +15V
ID(OFF)	Switch OFF Leakage Current	200	nA	VD = +10V, VS = -10V, VIN = 5V
IS(OFF)		200		VS = +10V, VD = -10V, VIN = 5V
I-	Negative Supply Quiescent Current	-10	mA	VIN = 0 or V+
I+	Positive Supply Quiescent Current	10		

TYPICAL PERFORMANCE CHARACTERISTICS (TA = +25°C, unless otherwise specified)

SWITCHING TIMES TEST CIRCUIT



TEST WAVEFORMS



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

