



U74AHCT4066

CMOS IC

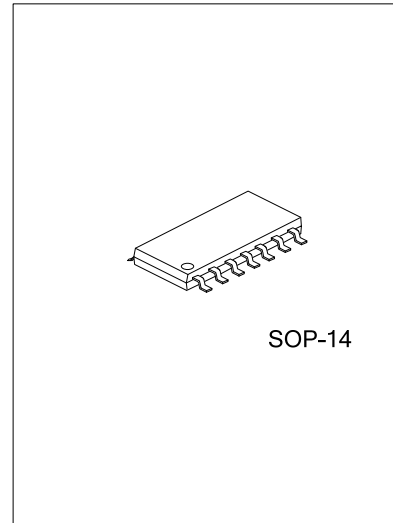
QUADRUPLE BILATERAL ANALOG SWITCH

DESCRIPTION

The **U74AHCT4066** is a quadruple bilateral analog switch which has 4 channels.

FEATURES

- * Inputs Are TTL-Voltage Compatible
- * Max t_{PD} of 6ns at 5 V
- * Low Power Dissipation: $I_{CC}=2\mu A(\text{Max})$
- * Low Input Current: $I_{IN}=1\mu A(\text{Max})$

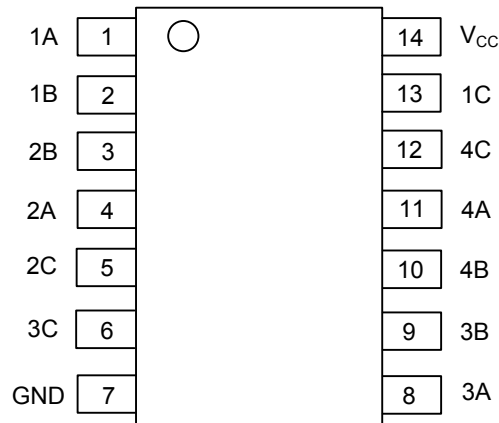


ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHCT4066L-S14-R	U74AHCT4066G-S14-R	SOP-14	Tape Reel

<p>U74AHCT4066G-S14-T</p> <p>(1)Packing Type (2)Package Type (3)Halogen Free</p>	<p>(1) R: Tape Reel (2) S14: SOP-14 (3) G: Halogen Free</p>
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■ PIN CONFIGURATION

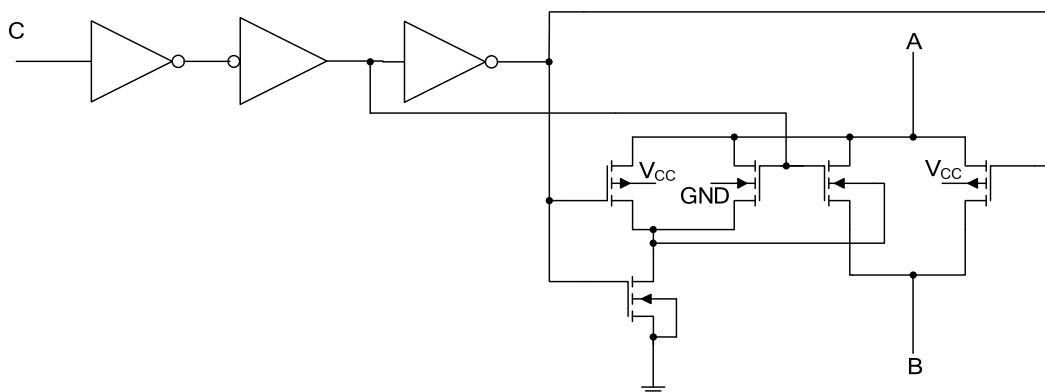


■ FUNCTION TABLE

INPUTS CONTROL (C)	SWITCH
H	ON
L	OFF

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC DIAGRAM



One Of Four Switches

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage Range	V_{CC}	-0.5 ~ +7	V
Input Voltage Range	V_C	-0.5 ~ +7	V
Switch I/O Voltage Range	V_{IO}	-0.5 ~ $V_{CC} + 0.5$	V
V_{CC} or GND Current	I_{CC}	±50	mA
I/O Diode Current	I_{IOK}	±50	mA
Control Input Clamp Current	I_{IK}	-20	mA
On-state Switch Current	I_T	±25	mA
Operating Temperature	T_{OPR}	-40 ~ + 85	°C
Storage Temperature	T_{STG}	-65 ~ + 150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	76	°C/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		4.5		5.5	V
High-Level Input Voltage	V_{IH}	$V_{CC}=4.5V$ to 5.5V	2			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=4.5V$ to 5.5V			0.8	V
Control Input Voltage	V_C		0		5.5	V
Input/Output Voltage	V_{IO}		0		V_{CC}	V
Input Transition Rise or Fall Rate	t_R / t_F	$V_{CC}=4.5V$ to 5.5V	0		20	ns/V

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
On-state Switch Resistance	R_{ON}	$V_{CC}=4.5V$, $I_T=-1mA$, $V_{IN}=GND$ or V_{CC} , $V_{CC}=V_{IH}$		21	75	Ω
Peak On-state Resistance	$R_{ON(P)}$			31	100	Ω
Difference In On-state Resistance Between Switches	ΔR_{ON}			2	15	Ω
Control Input Current	$I_{I(CTL)}$	$V_{CC}=5.5V$, $V_C=5.5V$ or GND			±0.1	μA
On-state Switch Leakage Current	$I_{S(ON)}$	$V_{CC}=5.5V$, $V_I=V_{CC}$ or GND, $V_C=V_{IH}$			±0.1	μA
Off-state Switch Leakage Current	$I_{S(OFF)}$	$V_{CC}=5.5V$, $V_I=V_{CC}$ and $V_O=GND$, or $V_I=GND$ and $V_O=V_{CC}$, $V_C=V_{IL}$			±0.1	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5V$, $V_C=V_{CC}$ or GND			2	μA
Control Input Capacitance	C_{IC}			1.5		pF
Feed-through Capacitance	C_F			0.5		pF
Switch Input/Output Capacitance	C_{IO}			5.5		pF

■ SWITCHING CHARACTERISTICS (T_A=25°C, SEE TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation Delay Time, From A to B Or B to A	t _{PLH} /t _{PHL}	V _{CC} =5V±0.5V	C _L =15pF		0.3	4	ns
			C _L =50pF		0.6	6	ns
Switch Turn-on Time, From C to A or B	t _{PZL} /t _{PZH}		C _L =15pF		1.6	7	ns
			C _L =50pF		2.1	12	ns
Switch Turn-off Time, From C to A or B	t _{PLZ} /t _{PHZ}		C _L =15pF		3.2	7	ns
			C _L =50pF		5.1	12	ns

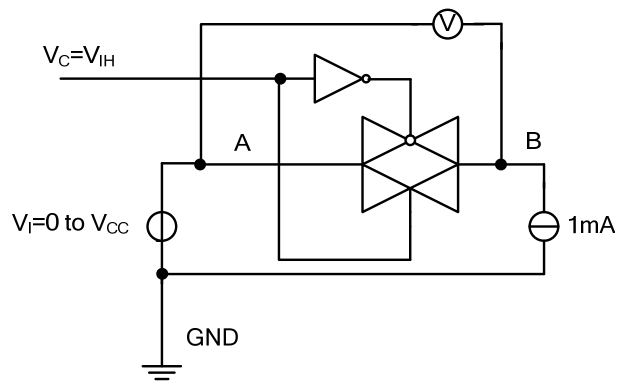
■ ANALOG SWITCHING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
Frequency Response(Switch On), From A to B Or B to A		C _L =50pF R _L =600Ω, f _{in} =1MHz, 20log ₁₀ (V _O /V _I)=-3dB		50		MHz		
Crosstalk(Between Any Switches), From A to B Or B to A		C _L =50pF, R _L =600Ω, f _{in} =1MHz	V _{CC} =4.5V		-45		dB	
Crosstalk(Control Input To Signal Output), From C to A or B					50		mV	
Feed-Through Attenuation (Switch Off), From A to B Or B to A						-40		dB
Sine-Wave Distortion				C _L =50pF, R _L =10KΩ, f _{in} =1KHz	V _{CC} =4.5V, V _I =4 V _{P-P}		0.1	

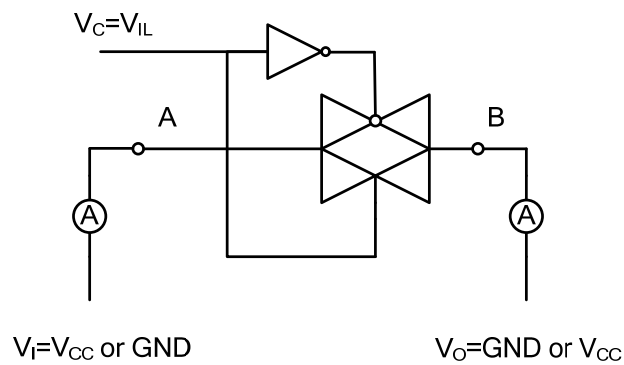
■ OPERATING CHARACTERISTICS(T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	C _L =50pF, f=1MHz		4.5		pF

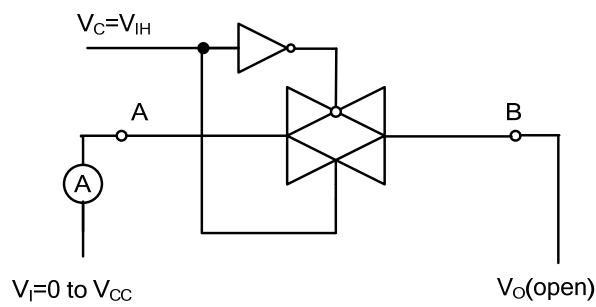
■ TEST CIRCUIT AND WAVEFORMS



Test circuit for measuring ON-state resistance R_{ON}

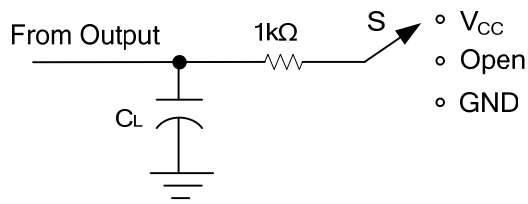


Test circuit for measuring OFF-state current



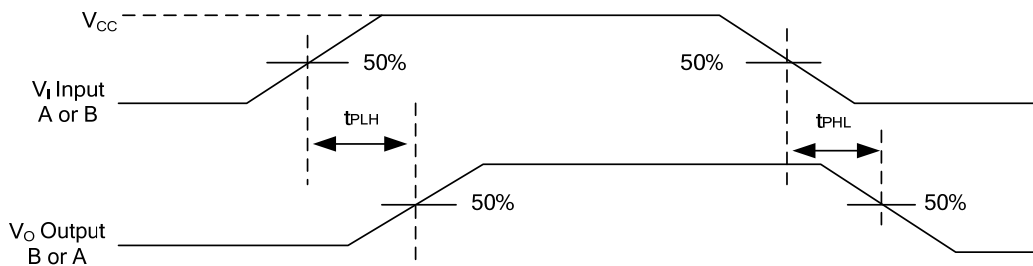
Test circuit for measuring ON-state current

■ TEST CIRCUIT AND WAVEFORMS(Cont.)

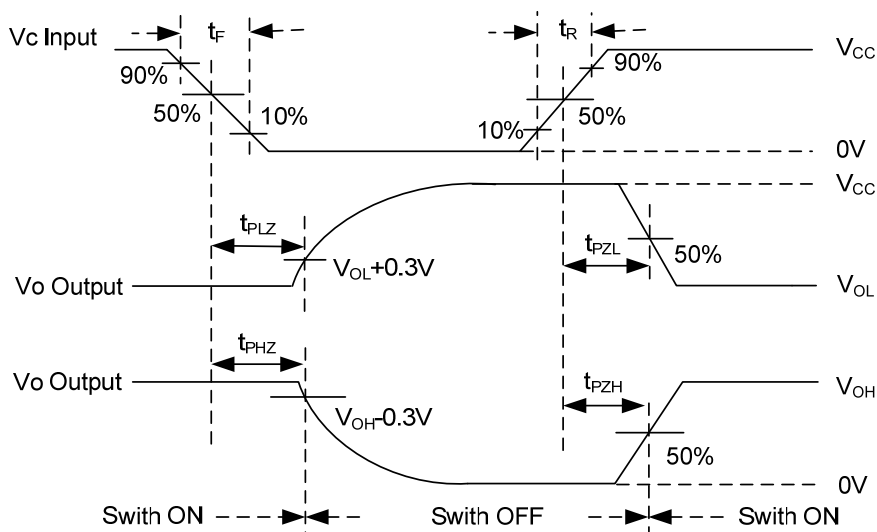


TEST	S	V _i
t _{PLH} /t _{PHL}	Open	Pulse
t _{PHZ} /t _{PZH}	GND	V _{CC}
t _{PLZ} /t _{PZL}	V _{CC}	GND

Test circuit for measuring propagation delay time, switching time



Waveforms showing the Input(V_i) to Output(V_o) propagation delays



Waveforms showing the turn-on and turn-off times

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: PRR ≤ 1MHz, Z_o = 50Ω, t_r ≤ 3ns, t_f ≤ 3ns.

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