



U74HC4066

CMOS IC

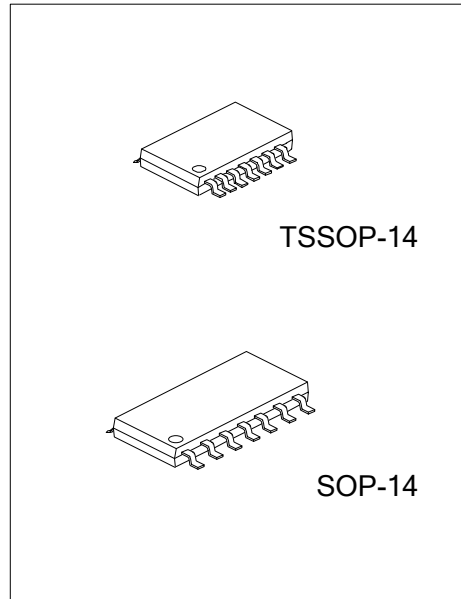
QUAD BILATERAL SWITCHES

DESCRIPTION

The UTC **U74HC4066** consists of four independent analog switches. Each switch has an Enable input (nE) which is active HIGH to decide the switch status.

FEATURES

- * Operation voltage range: 2~10V
- * Very low "ON" resistance: $V_{CC}=4.5V$ 50Ω
 $V_{CC}=6V$ 45Ω
 $V_{CC}=9V$ 35Ω

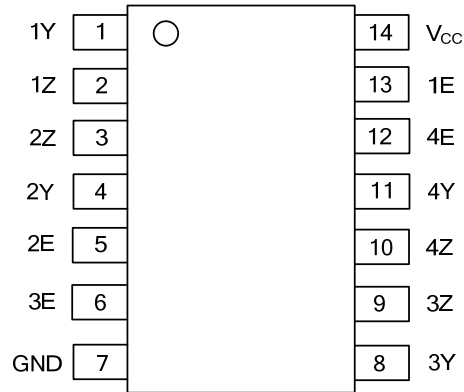


ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC4066L-P14-R	U74HC4066G-P14-R	TSSOP-14	Tape Reel
U74HC4066L-S14-R	U74HC4066G-S14-R	SOP-14	Tape Reel

<p>U74HC4066L-P14-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</p>	<p>(1) R: Tape Reel (2) P14: TSSOP-14, S14: SOP-14 (3) G: Halogen Free, L: Lead Free</p>
---	--

■ PIN CONFIGURATION

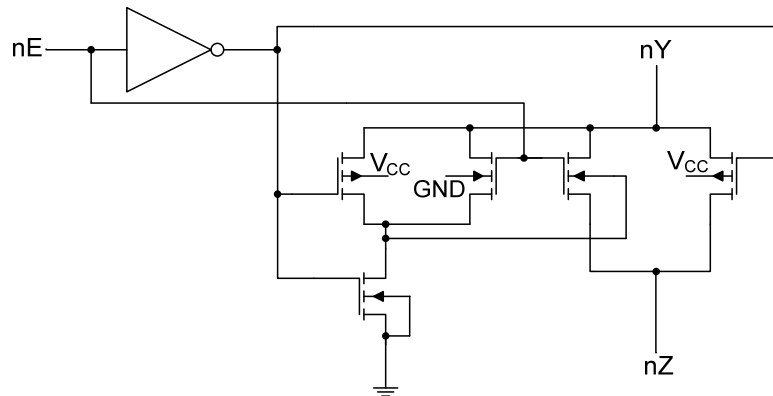


■ FUNCTION TABLE

INPUTS(nE)	SWITCH
H	ON
L	OFF

Note: H: High voltage level; L: Low voltage level.

■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5 ~ +11	V
Input Diode Current		I_{IK}	±20	mA
Switch Diode Current		I_{SK}	±20	mA
Switch Current		I_S	±25	mA
V_{CC} or GND Current		I_{CC}	±50	mA
Power Dissipation		P_D	500	mW
Derate above 70°C	SOP-14		8	mW/K
Derate above 60°C	TSSOP-14		5.5	mW/K
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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage		V_{CC}		2.0	5.0	10.0	V
Input Voltage		V_{IN}		GND		V_{CC}	V
Switch Voltage		V_S		GND		V_{CC}	V
Input Transition Rise or Fall Rate		t_R, t_F	$V_{CC}=2.0V$		6	1000	ns
			$V_{CC}=4.5V$			500	ns
			$V_{CC}=6.0V$			400	ns
			$V_{CC}=10.0V$			250	ns
Operating Temperature		T_A		-40		85	°C

■ ELECTRICAL CHARACTERISTICS

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT				
High-Level Input Voltage		V_{IH}	$V_{CC}=2.0V$	1.5			V				
			$V_{CC}=4.5V$	3.15			V				
			$V_{CC}=6.0V$	4.2			V				
			$V_{CC}=9.0V$	6.3			V				
Low-Level Input Voltage		V_{IL}	$V_{CC}=2.0V$			0.50	V				
			$V_{CC}=4.5V$			1.35	V				
			$V_{CC}=6.0V$			1.80	V				
			$V_{CC}=9.0V$			2.70	V				
Input Leakage Current		$I_{I(LEAK)}$	$V_{CC}=6V, V_{IN}=V_{CC}$ or GND			± 1.0	μA				
			$V_{CC}=10V, V_{IN}=V_{CC}$ or GND			± 2.0	μA				
current per channel	OFF-state	I_S	$V_{CC}=10V, V_{IN}=V_{IH}$ or $V_{IL}, V_S=V_{CC}-GND$			± 1.0	μA				
	ON-state					± 1.0	μA				
Quiescent Supply Current		I_Q	$V_{CC}=6V, V_{IN}=V_{IS}=V_{OS}=V_{CC}$ or GND			20	μA				
			$V_{CC}=10V, V_{IN}=V_{IS}=V_{OS}=V_{CC}$ or GND			40	μA				
ON-resistance	Peak		$V_{CC}=4.5V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$ to GND		54	118	Ω				
			$V_{CC}=6.0V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$ to GND		42	105	Ω				
			$V_{CC}=9.0V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$ to GND		32	88	Ω				
			$V_{CC}=2.0V, I_S=100\mu A, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=GND$		80		Ω				
	Rail			$V_{CC}=4.5V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=GND$		35	95	Ω			
				$V_{CC}=6.0V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=GND$		27	82	Ω			
				$V_{CC}=9.0V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=GND$		20	70	Ω			
				$V_{CC}=2.0V, I_S=100\mu A, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$		100		Ω			
				$V_{CC}=4.5V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$		42	106	Ω			
				$V_{CC}=6.0V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$		35	94	Ω			
				$V_{CC}=9.0V, I_S=1mA, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$		27	78	Ω			
				Maximum variation of ON-resistance between any two channels		ΔR_{ON}	$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$ to GND		5		Ω
							$V_{CC}=6.0V, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$ to GND		4		Ω
							$V_{CC}=9.0V, V_{IN}=V_{IH}$ or $V_{IL}, V_{IS}=V_{CC}$ to GND		3		Ω

■ DYNAMIC CHARACTERISTICS (T_a=25°C, GND=0V; t_r=t_f=6ns; C_L=50pF)

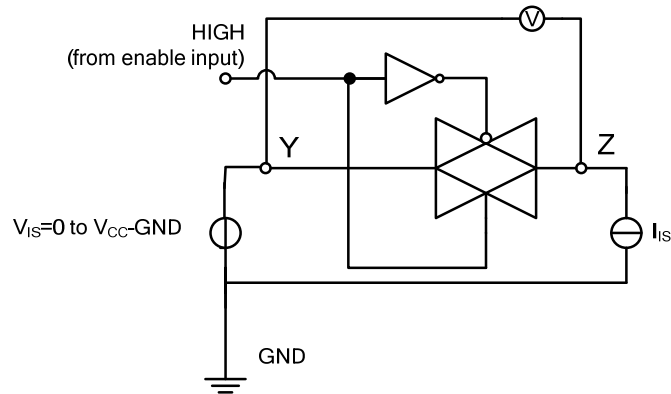
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay From V _{IS} to V _{OS}	t _{PHL} /t _{PLH}	V _{CC} =2.0V, R _L =∞		8	75	ns
		V _{CC} =4.5V, R _L =∞		3	15	ns
		V _{CC} =6.0V, R _L =∞		2	13	ns
		V _{CC} =9.0V, R _L =∞		2	10	ns
Turn-ON Time from nE to V _{OS}	t _{PZH} /t _{PZL}	V _{CC} =2.0V, R _L =1KΩ		36	125	ns
		V _{CC} =4.5V, R _L =1KΩ		13	25	ns
		V _{CC} =6.0V, R _L =1KΩ		10	21	ns
		V _{CC} =9.0V, R _L =1KΩ		8	16	ns
Turn-OFF Time from nE to V _{OS}	t _{PHZ} /t _{PLZ}	V _{CC} =2.0V, R _L =1KΩ		44	190	ns
		V _{CC} =4.5V, R _L =1KΩ		16	38	ns
		V _{CC} =6.0V, R _L =1KΩ		13	33	ns
		V _{CC} =9.0V, R _L =1KΩ		16	26	ns
Sine-Wave Distortion	THD	V _{CC} =4.5V, V _{IS(P-P)} =4V, f=1kHz, R _L =10k		0.04		%
		V _{CC} =9V, V _{IS(P-P)} =8V, f=1kHz, R _L =10k		0.02		%
		V _{CC} =4.5V, V _{IS(P-P)} =4V, f=10kHz, R _L =10k		0.12		%
		V _{CC} =9V, V _{IS(P-P)} =8V, f=10kHz, R _L =10k		0.06		%
Switch OFF Signal Feed-Through (Note 1)	α _{OFF}	V _{CC} =4.5V, R _L =600Ω, f=1MHz		-50		dB
		V _{CC} =9V, R _L =600Ω, f=1MHz		-50		dB
Crosstalk Between any two Switches (Note 1)	α _{CT(S)}	V _{CC} =4.5V, R _L =600Ω, f=1MHz		-60		dB
		V _{CC} =9V, R _L =600Ω, f=1MHz		-60		dB
Crosstalk Voltage Between any input to any Switch (Peak-to-Peak Value)	V _(P-P)	V _{CC} =4.5V, R _L =600Ω, f=1MHz		110		mV
		V _{CC} =9V, R _L =600Ω, f=1MHz		220		mV
Minimum Frequency Response(-3dB) (Note 2)	f _{MAX}	V _{CC} =4.5V, R _L =50Ω, C _L =10pF		180		MHz
		V _{CC} =9V, R _L =50Ω, C _L =10pF		200		MHz
maximum switch capacitance	C _S			8		pF

Note 1. Adjust input voltage V_{IS} is 0dbm level (0dbm=1mW into 600Ω)

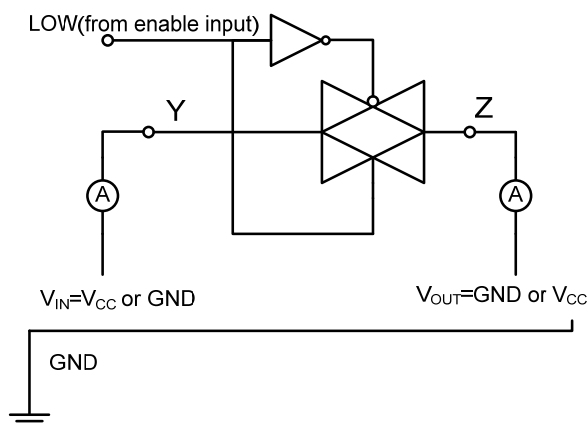
2. Adjust input voltage V_{IS} is 0dbm level at V_{OS} for 1MHz (0dbm=1mW into 50Ω)

■ TEST CIRCUIT AND WAVEFORMS

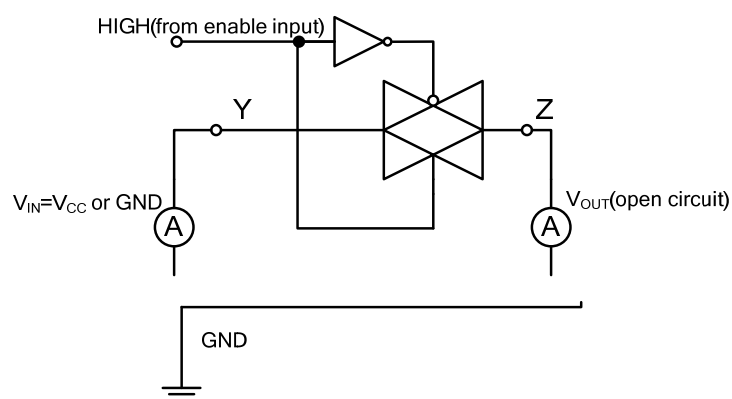
Test circuit for measuring ON-resistance (Ron)



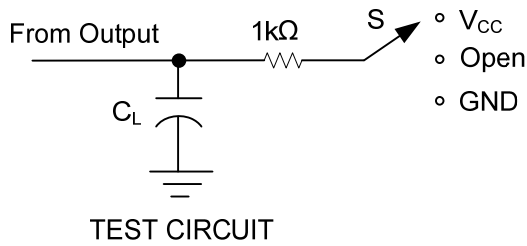
Test circuit for measuring OFF-state current



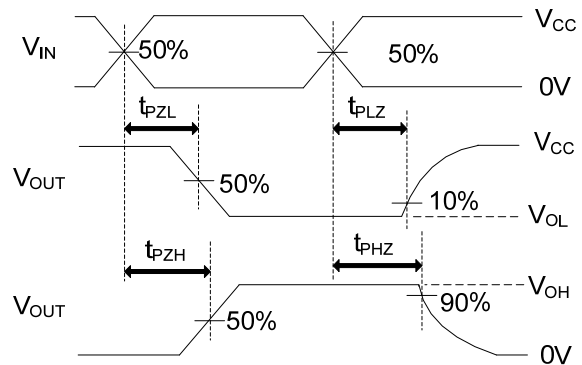
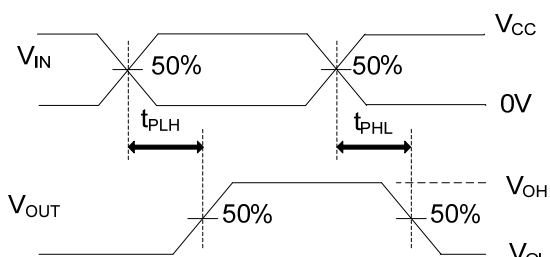
Test circuit for measuring ON-state current



■ TEST CIRCUIT AND WAVEFORMS(Cont.)



	S	V _{IN}
t _{PLH} /t _{PHL}	OPEN	V _{CC}
t _{PHZ} /t _{PZH}	GND	V _{CC}
t _{PLZ} /t _{PZL}	V _{CC}	GND



Note: 1. C_L includes probe and jig capacitance.
 2. PRR ≤ 1MHz, Z_o = 50Ω, t_r ≤ 6ns, t_f ≤ 6ns.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.