



UCD40106B

CMOS IC

HEX SCHMITT TRIGGERS

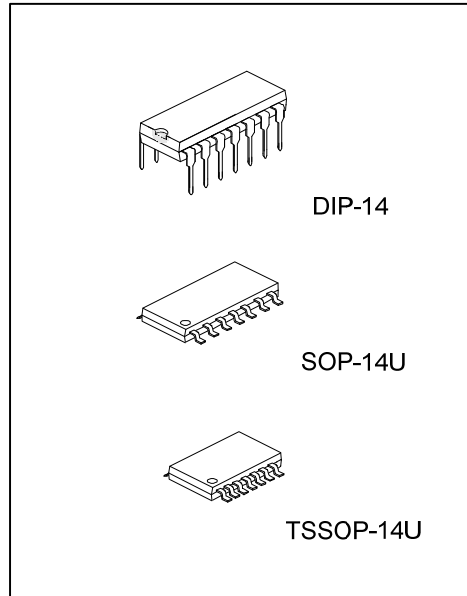
DESCRIPTION

The **UCD40106B** is a high speed Si-gate CMOS device which contains six independent Schmitt-trigger inverters and they perform the function $Y=\bar{A}$.

The device have different input threshold levels for positive-going (V_{T+}) and negative-going (V_{T-}) signals because of the Schmitt-trigger action in the input.

FEATURES

- * High voltage type (20V rating)
- * All inputs have Schmitt-trigger action
- * Hysteresis Voltage(TYP): 0.9V at $V_{CC}=5V$
2.3V at $V_{CC}=10V$
3.5V at $V_{CC}=15V$
- * Wide supply voltage range from 3V to 18V
- * Inputs are TTL-Voltage compatible
- * Noise immunity greater than 50%



ORDERING INFORMATION

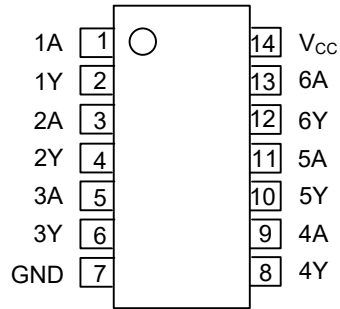
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCD40106BL-D14-T	UCD40106BG-D14-T	DIP-14	Tube
UCD40106BL-UEA-R	UCD40106BG-UEA-R	SOP-14U	Tape Reel
UCD40106BL-UEB-R	UCD40106BG-UEB-R	TSSOP-14U	Tape Reel

<p>UCD40106BG-D14-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) D14: DIP-14, UEA: SOP-14U, UEB: TSSOP-14U</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

DIP-14	SOP-14U / TSSOP-14U
<p>UTC □□□□ → Date Code</p> <p>UCD40106B □ → L: Lead Free</p> <p>□ → G: Halogen Free</p> <p>□□ → Lot Code</p>	<p>UTC □□□□ → Date Code</p> <p>UCD40106B □ → L: Lead Free</p> <p>□ → G: Halogen Free</p> <p>□□ → Lot Code</p>

■ PIN CONFIGURATION

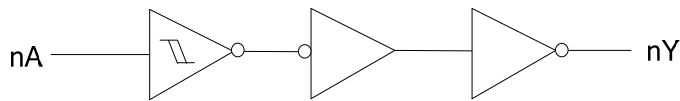


■ FUNCTION TABLE (each gate)

INPUT	OUTPUT
A	Y
L	H
H	L

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

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING ($T_A = 25^\circ\text{C}$, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ 20	V
Input Voltage	V_{IN}		-0.5 ~ $V_{CC}+0.5$	V
DC Input Current, Any One Input	I_{IN}		± 10	mA
Storage Temperature	T_{STG}		-65 ~ +150	$^\circ\text{C}$

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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	3		18	V
Input Voltage	V_{IN}		0		V_{CC}	V
Operating Temperature	T_A		-40		+125	$^\circ\text{C}$

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	75	$^\circ\text{C/W}$
	SOP-14U	105	$^\circ\text{C/W}$
	TSSOP-14U	135	$^\circ\text{C/W}$

■ STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Positive-Going Input Threshold Voltage	V _{T+}	V _{CC} =5V	2.2		3.6	2.2		3.6	V
		V _{CC} =10V	4.6		7.1	4.6		7.1	V
		V _{CC} =15V	6.6		10.8	6.6		10.8	V
Negative-Going Input Threshold Voltage	V _{T-}	V _{CC} =5V	0.9		2.8	0.9		2.8	V
		V _{CC} =10V	2.5		5.2	2.5		5.2	V
		V _{CC} =15V	4.0		7.4	4.0		7.4	V
Hysteresis Voltage (V _{T+} -V _{T-}) (see figure 3)	ΔV _T	V _{CC} =5V	0.3		1.6	0.3		1.6	V
		V _{CC} =10V	1.2		3.6	1.2		3.6	V
		V _{CC} =15V	1.6		5.0	1.6		5.0	V
High-Level Output Voltage	V _{OH}	V _{CC} =5V, I _o <1μA	4.95			4.95			V
		V _{CC} =10V, I _o <1μA	9.95			9.95			V
		V _{CC} =15V, I _o <1μA	14.95			14.95			V
Low-Level Output Voltage	V _{OL}	V _{CC} =5V, I _o <1μA			0.05			0.05	V
		V _{CC} =10V, I _o <1μA			0.05			0.05	V
		V _{CC} =15V, I _o <1μA			0.05			0.05	V
High-level Output Current	I _{OH}	V _{CC} =5V, V _o =4.6V	-0.51			-0.36			mA
		V _{CC} =5V, V _o =2.5V	-1.6			-1.15			mA
		V _{CC} =10V, V _o =9.5V	-1.3			-0.9			mA
		V _{CC} =15V, V _o =13.5V	-3.4			-2.4			mA
Low-level Output Current	I _{OL}	V _{CC} =5V, V _o =0.4V	0.51			0.36			mA
		V _{CC} =10V, V _o =0.5V	1.3			0.9			mA
		V _{CC} =15V, V _o =1.5V	3.4			2.4			mA
Input Leakage Current	I _{I(LEAK)}	V _{CC} =18V, V _{IN} =V _{CC} or GND			±0.1			±1	μA
Quiescent Supply Current	I _{DD}	V _{CC} =5V, V _{IN} =V _{CC} or GND, I _{OUT} =0			1			30	μA
		V _{CC} =10V, V _{IN} =V _{CC} or GND, I _{OUT} =0			2			60	μA
		V _{CC} =15V, V _{IN} =V _{CC} or GND, I _{OUT} =0			4			120	μA
		V _{CC} =20V, V _{IN} =V _{CC} or GND, I _{OUT} =0			20			600	μA

■ DYNAMIC CHARACTERISTICS (Input: t_R, t_F=20ns, unless otherwise specified)

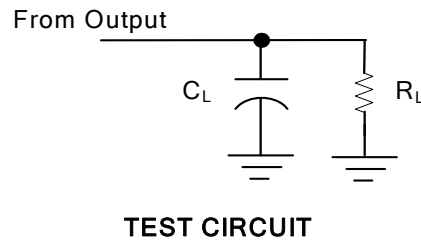
See Fig. 1 and Fig. 2 for test circuit and waveforms.

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay From Input (A) to Output (Y)	t _{PLH} /t _{PHL}	V _{CC} =5V, C _L =50Pf, R _L =200KΩ			280			300	ns
		V _{CC} =10V, C _L =50Pf, R _L =200KΩ			140			160	ns
		V _{CC} =15V, C _L =50Pf, R _L =200KΩ			120			140	ns
Output Transition Time	t _{TLH} /t _{THL}	V _{CC} =5V, C _L =50Pf, R _L =200KΩ			200			220	ns
		V _{CC} =10V, C _L =50Pf, R _L =200KΩ			100			120	ns
		V _{CC} =15V, C _L =50Pf, R _L =200KΩ			80			100	ns

■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Average Input Capacitance	C _{IN}	Any Input			7.5	pF
Power Dissipation Capacitance	C _{PD}	Any Gate		14		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.

Fig. 1 Load circuitry for switching times.

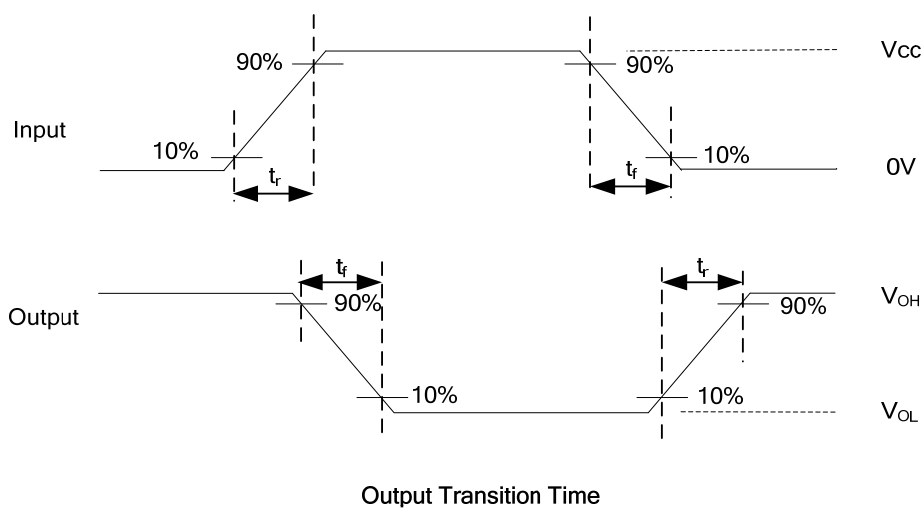
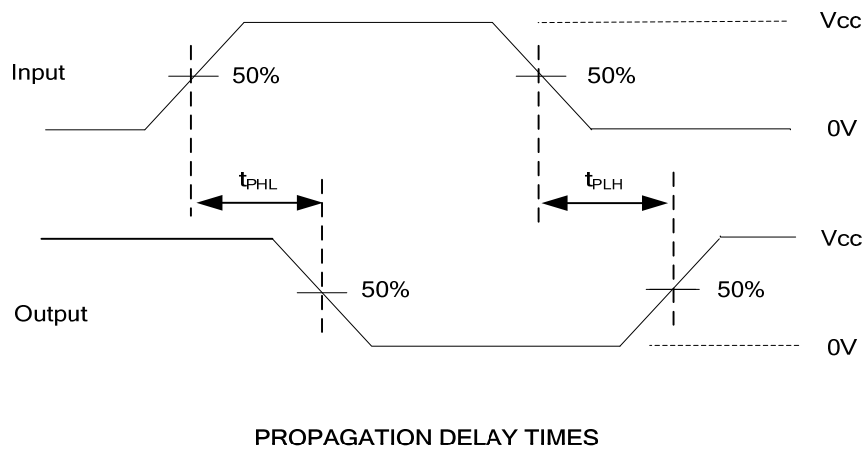


Fig. 2 Propagation delay from input(A) to output(Y) and Output transition time.

■ TEST CIRCUIT AND WAVEFORMS(Cont.)

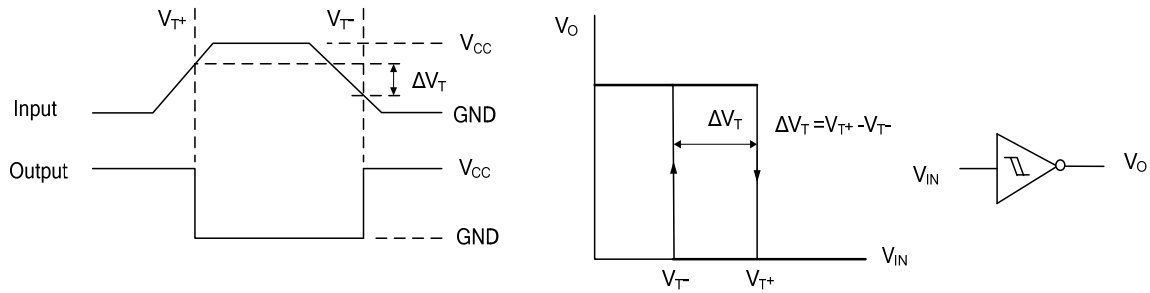


Fig. 3 Hysteresis definition, characteristics, and test setup

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