UNISONIC TECHNOLOGIES CO., LTD

U74AC14

CMOS IC

HEX SCHMITT-TRIGGER INVERTER

SOP-14U

TSSOP-14U

■ **DESCRIPTION**

The **U74AC14** contains six independent inverter with Schmitt-trigger , provides the Function $Y = \overline{A}$

■ **FEATURES**

* Operation voltage range: 2.0~6.0V
* Low power dissipation: I_{CC}=20µA (Max.)
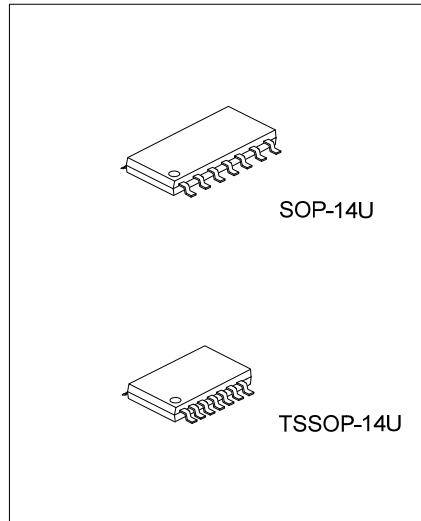
■ **ORDERING INFORMATION**

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AC14L-UEA-R	U74AC14G-UEA-R	SOP-14U	Tape Reel
U74AC14L-UEB-R	U74AC14G-UEB-R	TSSOP-14U	Tape Reel

U74AC14G-UEA-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) UEA: SOP-14U, UEB: TSSOP-14U
(3) G: Halogen Free and Lead Free, L: Lead Free

■ **MARKING**

14 13 12 11 10 9 8
UTC □□□□
U74AC14 □
1 2 3 4 5 6 7

Date Code
L: Lead Free
G: Halogen Free
Lot Code

■ **PIN CONFIGURATION**

```
        1A  | 1      ◯      14 |  Vcc
        1Y  | 2             13 |  6A
        2A  | 3             12 |  6Y
        2Y  | 4             11 |  5A
        3A  | 5             10 |  5Y
        3Y  | 6              9 |  4A
       GND  | 7              8 |  4Y
```
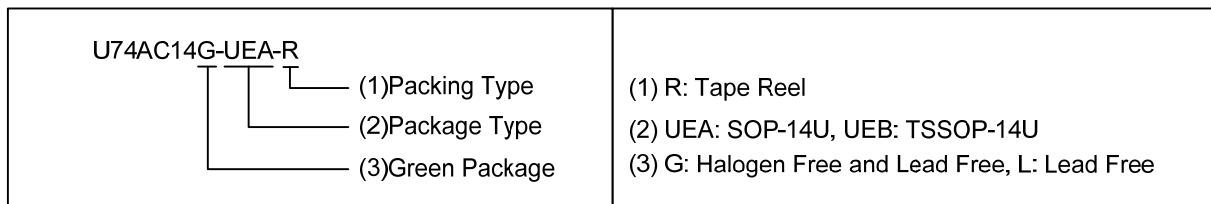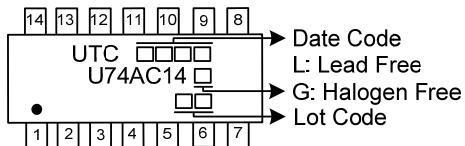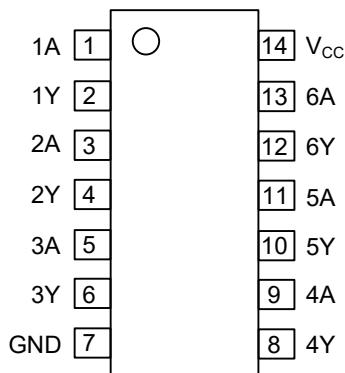
■ **FUNCTION TABLE** (each gate)

INPUT(A)	OUTPUT(Y)
L	H
H	L

■ **LOGIC DIAGRAM** (positive logic)

```
A ——— 1 ——[ ⎍ >o ]— 2 ——— Y
```

```
1A  1 ┌──────────┐ 2   1Y
2A  3 │    1     │ 4   2Y
3A  5 │          │ 6   3Y
4A  9 │          │ 8   4Y
5A 11 │          │ 10  5Y
6A 13 └──────────┘ 12  6Y
```

IEC logic symbol

U74AC14

CMOS IC
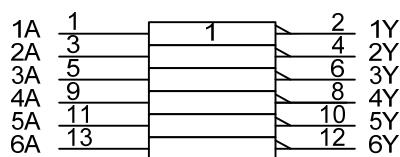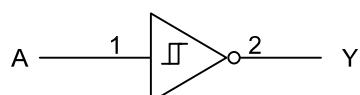
■ **ABSOLUTE MAXIMUM RATING** (T$_A$=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V$_{CC}$	-0.5 ~ 7	V
Input Voltage	V$_{IN}$	-0.5 ~ V$_{CC}$+0.5	V
Output Voltage	V$_{OUT}$	-0.5 ~ V$_{CC}$+0.5	V
Input Clamp Current	I$_{IK}$	±20	mA
Output Clamp Current	I$_{OK}$	±20	mA
Output Current	I$_{OUT}$	±50	mA
V$_{CC}$ or GND Current	I$_{CC}$	±200	mA
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	SOP-14U	θ$_{JA}$	95	°C/W
	TSSOP-14U		120	°C/W

■ **RECOMMENDED OPERATING CONDITIONS**

PARAMETER		SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage		V$_{CC}$	2.0		6.0	V
Input Voltage		V$_{IN}$	0		V$_{CC}$	V
Output Voltage		V$_{OUT}$	0		V$_{CC}$	V
High-Level Output Current	V$_{CC}$=3V	I$_{OH}$			-12	mA
	V$_{CC}$=4.5V				-24	mA
	V$_{CC}$=5.5V				-24	mA
Low-Level Output Current	V$_{CC}$=3V	I$_{OL}$			12	mA
	V$_{CC}$=4.5V				24	mA
	V$_{CC}$=5.5V				24	mA
Operating free-air temperature		T$_A$	-40		+125	°C

U74AC14

■ **STATIC CHARACTERISTICS** (T$_A$=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V$_{IH}$	V$_{CC}$=3.0V	0.8	1.8	2.2	V
		V$_{CC}$=4.5V	1.5	2.6	3.2	V
		V$_{CC}$=5.5V	1.6	3.2	3.9	V
Low-Level Input Voltage	V$_{IL}$	V$_{CC}$=3.0V	0.5	0.8	1	V
		V$_{CC}$=4.5V	0.9	1.4	1.8	V
		V$_{CC}$=5.5V	1.1	1.8	2.3	V
Hysteresis	V$_{TH}$	V$_{CC}$=3.0V	0.3	1	1.2	V
		V$_{CC}$=4.5V	0.4	1.2	1.4	V
		V$_{CC}$=5.5V	0.5	1.4	1.6	V
High-Level Output Voltage	V$_{OH}$	V$_{CC}$=3.0V, I$_{OH}$=-50µA	2.9			V
		V$_{CC}$=4.5V, I$_{OH}$=-50µA	4.4			V
		V$_{CC}$=5.5V, I$_{OH}$=-50µA	5.4			V
		V$_{CC}$=3.0V, I$_{OH}$=-12mA	2.56			V
		V$_{CC}$=4.5V, I$_{OH}$=-24mA	3.86			V
		V$_{CC}$=5.5V, I$_{OH}$=-24mA	4.86			V
Low-Level Output Voltage	V$_{OL}$	V$_{CC}$=3.0V, I$_{OL}$=50µA		0.002	0.1	V
		V$_{CC}$=4.5V, I$_{OL}$=50µA		0.001	0.1	V
		V$_{CC}$=5.5V, I$_{OL}$=50µA		0.001	0.1	V
		V$_{CC}$=3.0V, I$_{OL}$=12mA			0.36	V
		V$_{CC}$=4.5V, I$_{OL}$=24mA			0.36	V
		V$_{CC}$=5.5V, I$_{OL}$=24mA			0.36	V
Input Leakage Current	I$_{I(LEAK)}$	V$_{IN}$=V$_{CC}$ or GND, V$_{CC}$=5.5			±0.1	µA
Quiescent Supply Current	I$_Q$	V$_{CC}$=5.5V, V$_{IN}$=V$_{CC}$ or GND, I$_{OUT}$=0			2	µA
Input Capacitance	C$_{IN}$	V$_{IN}$=V$_{CC}$ or GND		4.5		pF

■ **DYNAMIC CHARACTERISTICS** (T$_A$=25°C, Input: t$_R$, t$_F$ ≤ 2.5ns; PRR ≤ 1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A) to output (Y)	t$_{PLH}$	V$_{CC}$=3.3V, C$_L$=50pF	1.5	6	13.5	ns
		V$_{CC}$=5.0V, C$_L$=50pF	1.5	5	10	ns
	t$_{PHL}$	V$_{CC}$=3.3V, C$_L$=50pF	1.5	6	11.5	ns
		V$_{CC}$=5.0V, C$_L$=50pF	1.5	5	8.5	ns

■ **OPERATING CHARACTERISTICS**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C$_{PD}$	C$_L$=50 pF, f=1MHz, V$_{CC}$=5V		25		pF

■ **TEST CIRCUIT AND WAVEFORMS**

Output

C_L (Note)   500Ω
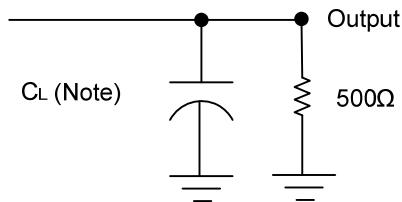
Note: C_L includes probe and jig capacitance.

Fig.1 Load circuitry for switching times.
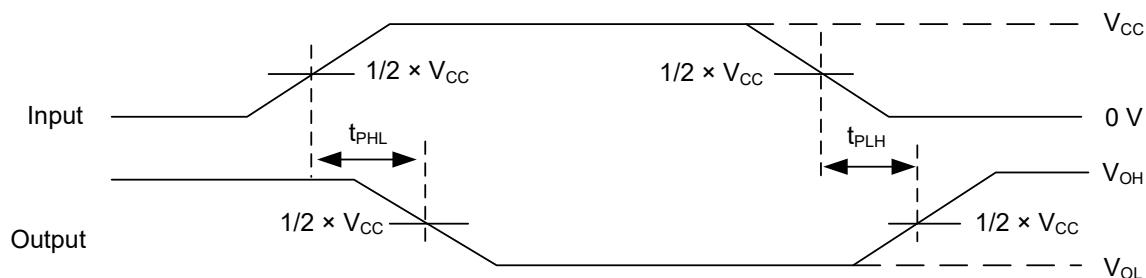
Fig.2 Propagation delay from input(A) to output(Y).

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