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XC74UL14AA

ETR1306_002

CMOS Logic

■ GENERAL DESCRIPTION

The XC74UL14AA is a CMOS schmitt trigger inverter, manufactured using silicon gate CMOS fabrication.

CMOS low power circuit operation makes high speed LS-TTL operation achievable.

With a wave forming buffer connected internally, stabilized output can be achieved as the circuit offers high noise immunity.

As the XC74UL14AA is integrated into mini molded, SSOT-25 and SON-6 package, high density mounting is possible.

■ APPLICATIONS

- Palmtops
- Digital equipment

■ FEATURES

High Speed Operation : tpd = 2.3ns (TYP.)

Operating Voltage Range : 2V ~ 5.5V

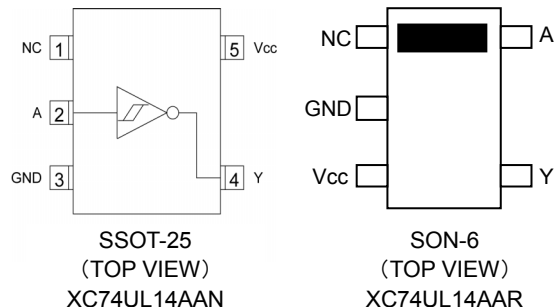
Low Power Consumption : 1 μ A (MAX.)

CMOS Schmitt Trigger Inverter

Ultra Small Packages : SSOT-25, SON-6*

* Under Development

■ PIN CONFIGURATION



■ FUNCTIONS

| INPUT | OUTPUT |
|-------|--------|
| A | Y |
| H | L |
| L | H |

H=High level

L=Low level

■ ABSOLUTE MAXIMUM RATINGS

Ta=-40°C~85°C

| PARAMETER | SYMBOL | RATINGS | UNITS |
|---------------------------|-----------------------------------|--------------|-------|
| Supply Voltage | VCC | -0.5~+6.0 | V |
| Input Voltage | VIN | -0.5~+6.0 | V |
| Output Voltage | VOUT | -0.5~VCC+0.5 | V |
| Input Diode Current | I _{IK} | -20 | mA |
| Output Diode Current | I _{OK} | ±20 | mA |
| Output Current | I _{OUT} | ±25 | mA |
| VCC,GND Current | I _{CC} ,I _{GND} | ±50 | mA |
| Power Dissipation | SSOT-25* ¹ | 150 | mW |
| | SON-6* ² | 200 | |
| Storage Temperature Range | T _{stg} | -65~+150 | °C |

Voltage is all ground standardized.

* 1) Ta=55°C

* 2) Ta=25°C

RECOMMENDED OPERATING CONDITIONS

| PARAMETER | SYMBOL | V _{CC} (V) | CONDITIONS | UNITS |
|-----------------------------|------------------|---------------------|-------------------|-------|
| Supply Voltage | V _{CC} | — | 2~5.5 | V |
| Input Voltage | V _{IN} | — | 0~5.5 | V |
| Output Voltage | V _{OUT} | — | 0~V _{CC} | V |
| Operating Temperature Range | T _{opr} | — | -40~+85 | °C |
| Output Current | I _{OH} | 3.0 | -4 | mA |
| | | 4.5 | -8 | |
| | I _{OL} | 3.0 | 4 | |
| | | 4.5 | 8 | |

DC ELECTRICAL CHARACTERISTICS

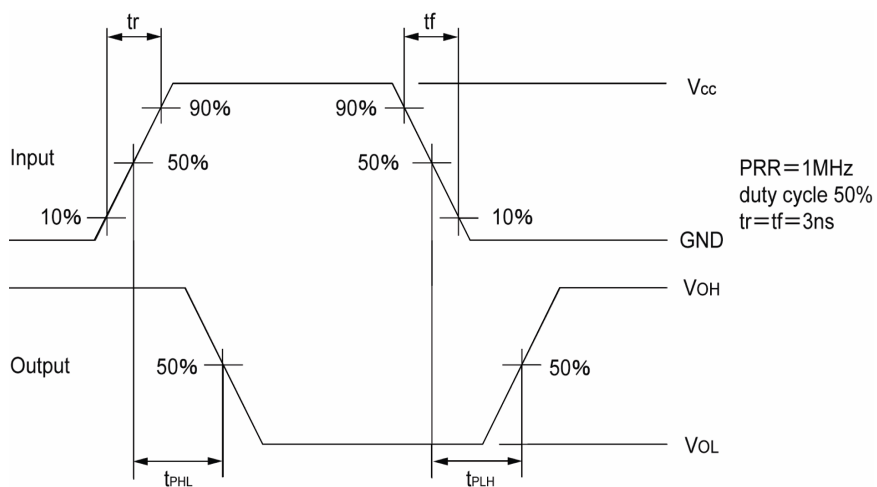
| PARAMETER | SYMBOL | V _{CC} (V) | CONDITIONS | Ta=25°C | | | Ta=-40°C~85°C | | UNITS | |
|-----------------------|-----------------|----------------------------------|-----------------------------------------------------------------|-------------------------|------|------|---------------|------|-------|---|
| | | | | MIN. | TYP. | MAX. | MIN. | MAX. | | |
| Threshold Voltage | V _{T+} | 2.0 | | — | — | 2.2 | — | 2.2 | V | |
| | | 3.0 | | — | — | 3.15 | — | 3.15 | | |
| | | 5.5 | | — | — | 3.85 | — | 3.85 | | |
| | V _{T-} | 2.0 | | 0.9 | — | — | 0.9 | — | V | |
| | | 3.0 | | 1.35 | — | — | 1.35 | — | | |
| | | 5.5 | | 1.65 | — | — | 1.65 | — | | |
| Hysteresis Voltage | V _H | 3.0 | 0.25 | — | 1.2 | 0.25 | 1.2 | | | |
| | | 4.5 | 0.30 | — | 1.4 | 0.30 | 1.4 | | | |
| | | 5.5 | 0.35 | — | 1.6 | 0.35 | 1.6 | | | |
| Output Voltage | V _{OH} | 2.0 | V _{IN} =V _{IL} | I _{OH} =-50 μA | 1.9 | 2.0 | — | 1.9 | — | V |
| | | 3.0 | | | 2.9 | 3.0 | — | 2.9 | — | |
| | | 4.5 | | | 4.4 | 4.5 | — | 4.4 | — | |
| | | 3.0 | | | 2.58 | — | — | 2.48 | — | |
| | | 4.5 | | | 3.94 | — | — | 3.80 | — | |
| | V _{OL} | V _{IN} =V _{IH} | I _{OL} =50 μA | 2.0 | — | — | 0.1 | — | 0.1 | V |
| | | | | 3.0 | — | — | 0.1 | — | 0.1 | |
| | | | | 4.5 | — | — | 0.1 | — | 0.1 | |
| | | | | 3.0 | — | — | 0.36 | — | 0.44 | |
| | | | | 4.5 | — | — | 0.36 | — | 0.44 | |
| Input Current | I _{IN} | 5.5 | V _{IN} =V _{CC} or GND | -0.1 | — | 0.1 | -1.0 | 1.0 | μA | |
| Static Supply Current | I _{CC} | 5.5 | V _{IN} =V _{CC} or GND, I _{OUT} =0 μA | — | — | 1.0 | — | 10.0 | | |

SWITCHING ELECTRICAL CHARACTERISTICS

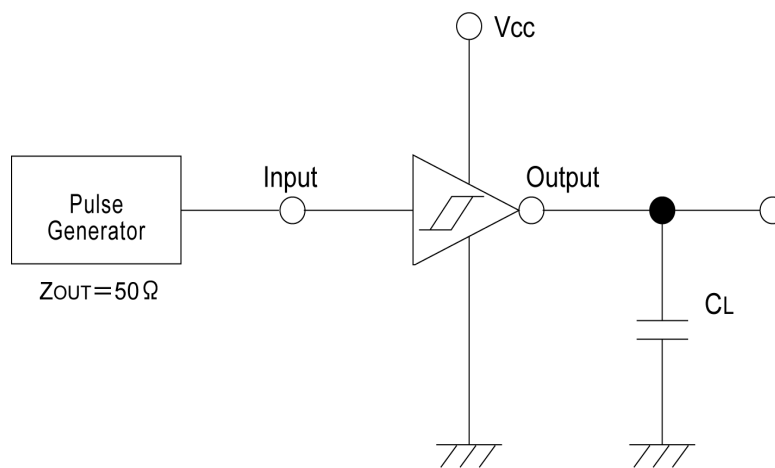
t_r=t_f=3ns

| PARAMETER | SYMBOL | C _L | V _{CC} (V) | CONDITIONS | Ta=25°C | | | Ta=-40°C~85°C | | UNITS |
|-------------------------------|------------------|-----------------|---------------------|-----------------------------------------|---------|------|------|---------------|------|-------|
| | | | | | MIN. | TYP. | MAX. | MIN. | MAX. | |
| Delay Time | t _{PLH} | 15pF | 3.3 | | — | 2.8 | 12.8 | 1.0 | 15.0 | ns |
| | | | 5.0 | | — | 2.1 | 8.6 | 1.0 | 10.0 | |
| | | 50pF | 3.3 | | — | 4.3 | 16.3 | 1.0 | 18.5 | ns |
| | | | 5.0 | | — | 3.1 | 10.6 | 1.0 | 12.0 | |
| | t _{PHL} | 15pF | 3.3 | | — | 3.1 | 12.8 | 1.0 | 15.0 | ns |
| | | | 5.0 | | — | 2.5 | 8.6 | 1.0 | 10.0 | |
| | | 50pF | 3.3 | | — | 4.4 | 16.3 | 1.0 | 18.5 | ns |
| | | | 5.0 | | — | 3.4 | 10.6 | 1.0 | 12.0 | |
| Input Capacitance | C _{IN} | — | 5.0 | V _{IN} =V _{CC} or GND | — | 2 | 10 | — | 10 | pF |
| Power Dissipation Capacitance | C _{pd} | No Load, f=1MHz | | | — | 10 | — | — | — | pF |

■ WAVEFORM



■ TEST CIRCUIT



Note: Open output when measuring supply current

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