

CMOS Logic

■ GENERAL DESCRIPTION

XC74WLU04ASR is triple inverter (unbuffered) manufactured using silicon gate CMOS processes. The small supply current, which is one of the features of the CMOS logic, gives way to high speed operations which enables LS-TTL.

With wave forming buffers connected internally, stabilized output can be achieved as the series offers high noise immunity.

As the series is integrated into a mini molded, MSOP-8B package, high density mounting is possible.

■ Applications

- Palmtops
- Digital equipment

■ FEATURES

High Speed Operations : tpd = 2.3ns (TYP.) (VCC=5V)

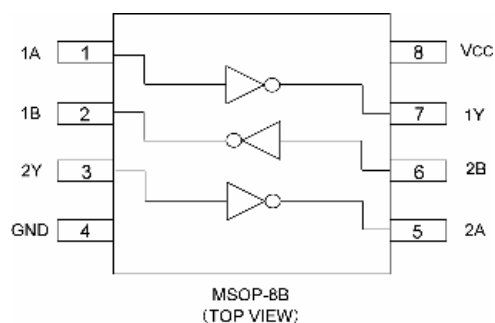
Operating Voltage Range : 2V ~ 5.5V

Low Power Consumption: 1 μ A (MAX.)@Ta=25°C

CMOS Logic Triple Inverter(Unbufferd)

Small Package : MSOP-8B

■ 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 |
| Switch Output Current | I _{OUT} | ±25 | mA |
| VCC,GND Current | I _{CC} ,I _{GND} | ±50 | mA |
| Power Dissipation (Ta = 25°C) | P _d | 300 | mW |
| Storage Temperature Range | T _{stg} | -65~+150 | °C |

Note : Voltage is all ground standardized.

RECOMMENDED OPERATING CONDITIONS

| PARAMETER | SYMBOL | 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 |

DC ELECTRICAL CHARACTERISTICS

| PARAMETER | SYMBOL | V _{CC} (V) | CONDITIONS | Ta=25°C | | | Ta=-40°C~85°C | | UNITS | | |
|-----------------------|-----------------|---------------------|---|-------------------------|-----------------------|------|---------------|------|-------|---|------|
| | | | | MIN. | TYP. | MAX. | MIN. | MAX. | | | |
| Input Voltage | V _{IH} | 2.0 | | 1.70 | — | — | 1.70 | — | V | | |
| | | 3.0 | | 2.40 | — | — | 2.40 | — | | | |
| | | 5.5 | | 4.40 | — | — | 4.40 | — | | | |
| | V _{IL} | 2.0 | | — | — | 0.30 | — | 0.30 | V | | |
| | | 3.0 | | — | — | 0.60 | — | 0.60 | | | |
| | | 5.5 | | — | — | 1.10 | — | 1.10 | | | |
| Output Voltage | V _{OH} | 2.0 | V _{IN} =V _{IH} | I _{OH} =-50 μA | 1.80 | 2.0 | — | 1.80 | — | V | |
| | | 3.0 | | | 2.70 | 3.0 | — | 2.70 | — | | |
| | | 4.5 | V _{IN} =GND | I _{OH} =-4mA | 4.05 | 4.5 | — | 4.05 | — | | |
| | | 3.0 | | | I _{OH} =-8mA | 2.58 | — | — | 2.48 | | — |
| | | 4.5 | | | | 3.94 | — | — | 3.80 | | — |
| | V _{OL} | 2.0 | V _{IN} =V _{IH} | I _{OL} =50 μA | — | — | 0.20 | — | 0.20 | V | |
| | | 3.0 | | | — | — | 0.30 | — | 0.30 | | |
| | | 4.5 | | | — | — | 0.45 | — | 0.45 | | |
| | | 3.0 | V _{IN} =V _{CC} | I _{OL} =4mA | — | — | 0.36 | — | 0.44 | | |
| | | 4.5 | | | I _{OL} =8mA | — | — | 0.36 | — | | 0.44 |
| Input Current | I _{IN} | 0~5.5 | V _{IN} =V _{CC} or GND | -0.1 | — | 0.1 | -1 | 1 | μA | | |
| Static Supply Current | I _{CC} | 5.5 | V _{IN} =V _{CC} or GND, I _{OUT} =0 μA | — | — | 1 | — | 10 | μA | | |

SWITCHING ELECTRICAL CHARACTERISTICS

(tr=tf=3ns)

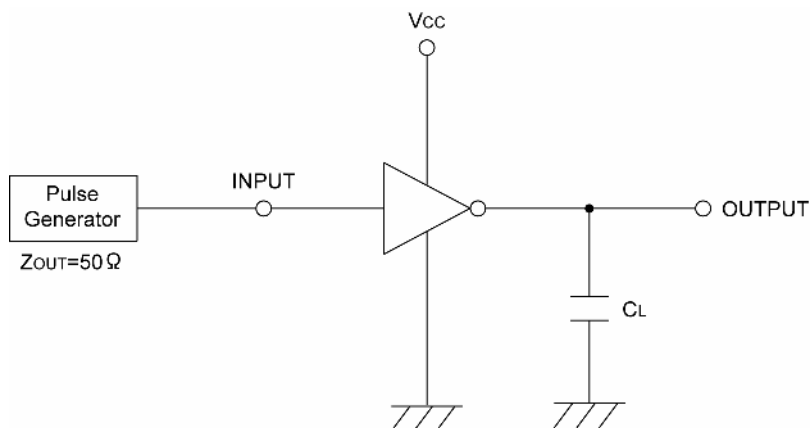
| PARAMETER | SYMBOL | CL | V _{CC} (V) | CONDITIONS | Ta=25°C | | | Ta=-40°C~85°C | | UNITS |
|-------------------------------|------------------|-----------------|---------------------|---|---------|------|------|---------------|------|-------|
| | | | | | MIN. | TYP. | MAX. | MIN. | MAX. | |
| Delay Time | t _{PLH} | 15pF | 3.3 | | — | 2.80 | 7.1 | 1.0 | 8.5 | ns |
| | | | 5.0 | | — | 2.40 | 5.5 | 1.0 | 6.0 | |
| | | 50pF | 3.3 | | — | 4.50 | 10.6 | 1.0 | 12.0 | ns |
| | | | 5.0 | | — | 3.60 | 7.0 | 1.0 | 8.0 | |
| | T _{PHL} | 15pF | 3.3 | | — | 2.70 | 7.1 | 1.0 | 8.5 | ns |
| | | | 5.0 | | — | 2.20 | 5.5 | 1.0 | 6.0 | |
| | | 50pF | 3.3 | | — | 4.2 | 10.6 | 1.0 | 12.0 | ns |
| | | | 5.0 | | — | 3.5 | 7.0 | 1.0 | 8.0 | |
| 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 |

NOISE CHARACTERISTICS

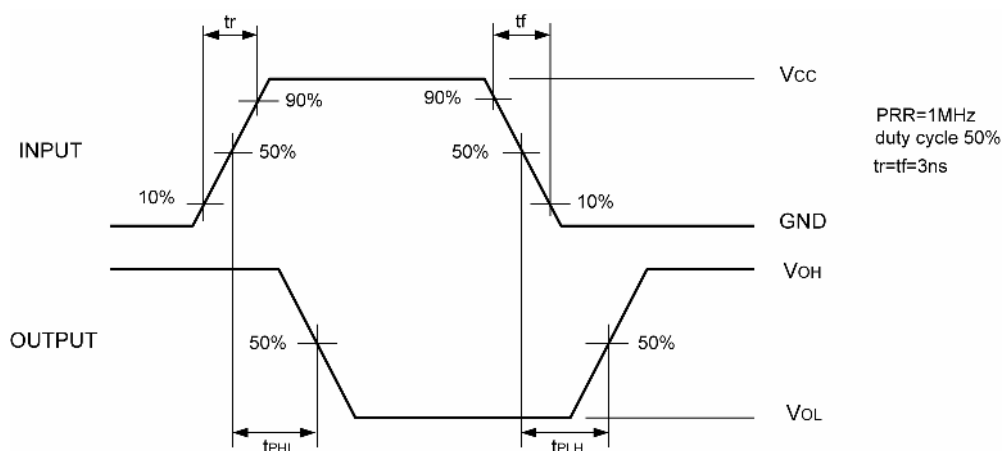
(tr=tf=3ns)

| PARAMETER | SYMBOL | CONDITIONS | | Ta=25°C | | | UNITS |
|---|--------|------------|--------|---------|------|------|-------|
| | | CL | Vcc(V) | MIN. | TYP. | MAX. | |
| Non Functional Output Maximum Dynamic VOL | VoLP | 50pF | 5.0 | — | 0.3 | 0.8 | V |
| Non Functional Output Minimum Dynamic VOL | VoLV | 50pF | 5.0 | -0.8 | -0.3 | — | V |
| Minimum Dynamic VIH | VIHD | 50pF | 5.0 | — | — | 3.5 | V |
| Maximum Dynamic VIL | VILD | 50pF | 5.0 | — | — | 1.5 | V |

TEST CIRCUIT



WAVEFORM



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