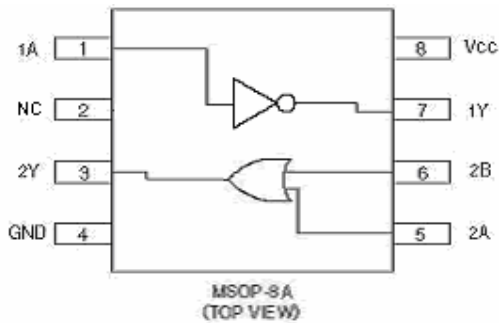


- ◆ CMOS INVERTER And OR Gate
- ◆ Operating Voltage Range : 2V ~ 5.5V
- ◆ High Speed Operation : tpd = 2.6ns TYP
- ◆ Low Power Consumption : 1μA (max)
- ◆ MSOP-8A Package

■ Description

ML74WLCESRG comprises of CMOS INVERTER and OR gate, manufactured using silicon gate CMOS processes. The small quiescent 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-8A package, high density mounting is possible.

■ Pin Configuration



■ Absolute Maximum Ratings

Ta=-40°C~85°C

| PARAMETER | SYMBOL | RATINGS | UNITS |
|-----------------------------|-----------|-----------------|-------|
| Power 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 | IiK | ±20 | mA |
| Output Diode current | IoK | ±20 | mA |
| Switch Output Current | IOUT | ±25 | mA |
| Vcc, GND Current | ICC, IGND | ±50 | mA |
| Power Dissipation (Ta=25°C) | Pd | 300 | mW |
| Storage Temperature | Tstg | -65 ~ +150 | °C |

Note: Voltage is all Ground standardized.

■ Applications

- Palmtops
- Digital Equipment

■ Features

High Speed Operation : tpd = 2.6ns TYP (Vcc=5V)
Operating Voltage Range: 2V ~ 5.5V
Low Power Consumption: 1μA (max)
Small Package : MSOP-8A

■ Function

INVERTER

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

OR GATE

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

H=High level

L=Low level

■ 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 | T _{opr} | -40 ~ +85 | °C |
| Input Rise / Fall Time | tr, tf | 0 ~ 200 (V _{CC} =3.3V) | ns |
| | | 0 ~ 100 (V _{CC} =5V) | |

■ DC Electrical Characteristics

| PARAMETER | SYMBOL | V _{CC} (V) | CONDITIONS | Ta=25°C | | | Ta=-40~85°C | | UNITS | | |
|--------------------------|-----------------|----------------------------------|--|------------------------|----------------------|------|-------------|------|-------|---|------|
| | | | | MIN | TYP | MAX | MIN | MAX | | | |
| Input Voltage | V _{IH} | 2.0 | | 1.5 | - | - | 1.5 | - | V | | |
| | | 3.0 | | 2.1 | - | - | 2.1 | - | | | |
| | | 5.5 | | 3.85 | - | - | 3.85 | - | | | |
| | V _{IL} | 2.0 | | - | - | 0.5 | - | 0.5 | V | | |
| | | 3.0 | | - | - | 0.9 | - | 0.9 | | | |
| | | 5.5 | | - | - | 1.65 | - | 1.65 | | | |
| Output Voltage | V _{OH} | 2.0 | V _{IN} =V _{IH} or V _{IL} | I _{OH} =-50μA | 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 | | I _{OH} =-4mA | 2.58 | - | - | 2.48 | - | | |
| | | 4.5 | | I _{OH} =-8mA | 3.94 | - | - | 3.80 | - | | |
| | V _{OL} | V _{IN} =V _{IH} | 2.0 | I _{OL} =50μA | - | - | 0.1 | - | 0.1 | V | |
| | | | 3.0 | | - | - | 0.1 | - | 0.1 | | |
| | | | 4.5 | | - | - | 0.1 | - | 0.1 | | |
| | | | 3.0 | | 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 | -1.0 | 1.0 | μA | | |
| Quiescent Supply Current | I _{CC} | 5.5 | V _{IN} =V _{CC} or GND, I _{OUT} =0μA | - | - | 1.0 | - | 10.0 | μA | | |

■ Switching Electrical Characteristics

| PARAMETER | SYMBOL | C _L | V _{CC} (V) | CONDITIONS | Ta=25°C | | | Ta=-40~85°C | | UNITS |
|-------------------------------|------------------|-----------------|---------------------|---|---------|-----|------|-------------|-----|-------|
| | | | | | MIN | TYP | MAX | MIN | MAX | |
| Propagation Delay Time | t _{PLH} | 15pF | 3.3 | | - | 3.7 | 7.9 | 1 | 9.5 | ns |
| | | | 5.0 | | - | 2.7 | 5.5 | 1 | 6.5 | |
| | | 50pF | 3.3 | | - | 5.4 | 11.4 | 1 | 13 | ns |
| | | | 5.0 | | - | 3.6 | 7.5 | 1 | 8.5 | |
| | t _{PHL} | 15pF | 3.3 | | - | 3.3 | 7.9 | 1 | 9.5 | ns |
| | | | 5.0 | | - | 2.5 | 5.5 | 1 | 6.5 | |
| | | 50pF | 3.3 | | - | 4.6 | 11.4 | 1 | 13 | ns |
| | | | 5.0 | | - | 3.5 | 7.5 | 1 | 8.5 | |
| Input Capacitance | C _{IN} | - | 5.0 | V _{IN} =V _{CC} or GND | - | 2 | 10 | 1 | 10 | pF |
| Power Dissipation Capacitance | C _{pd} | No Load, f=1MHz | - | - | - | 9.3 | - | - | - | pF |

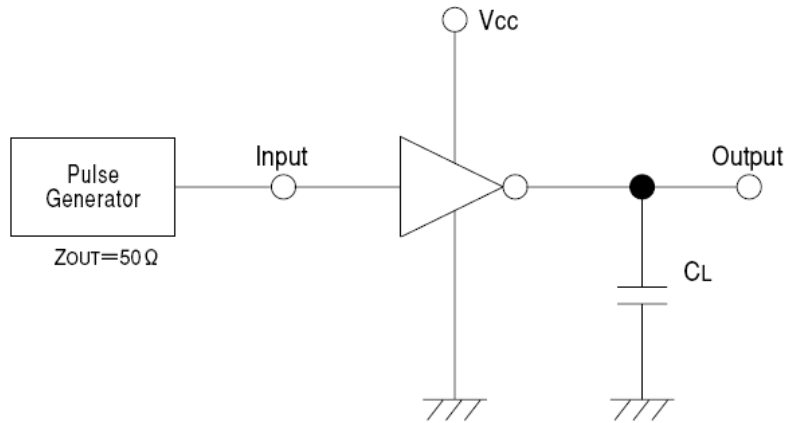
Tr=tf=3ns

■ Noise Characteristics

(tr=tf=3ns)

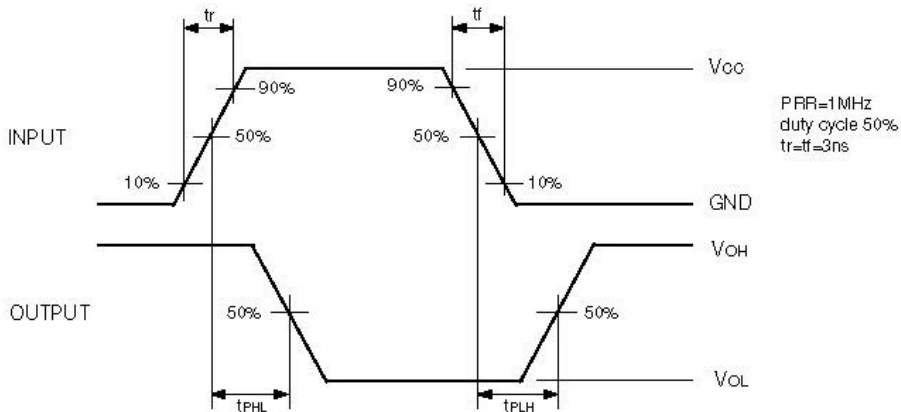
| PARAMETER | SYMBOL | CL | Vcc(V) | CONDITIONS | Ta=25°C | | | UNITS |
|--|--------|------|--------|------------|---------|------|-----|-------|
| | | | | | MIN | TYP | MAX | |
| Not functioning output maximum dynamic VOL | VOLP | 50pF | 5.0 | | -- | 0.3 | 0.8 | V |
| Not functioning output minimum 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 |

■ Typical Application Circuit

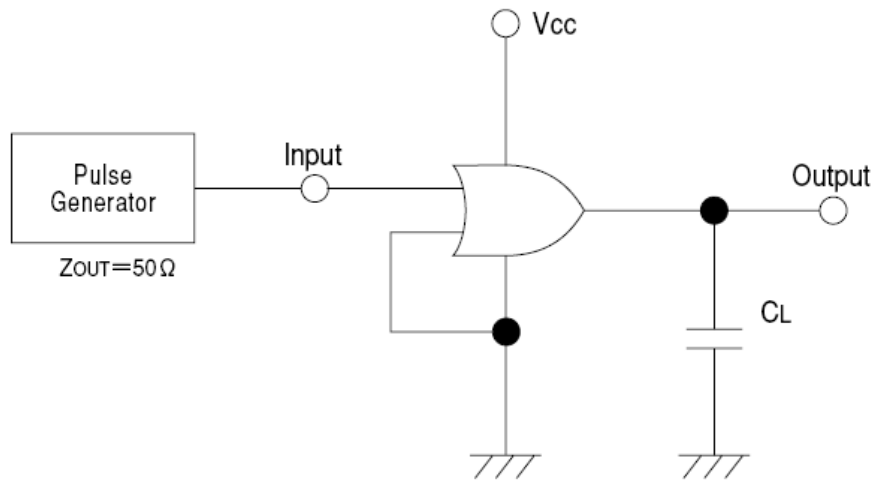


Note: Open output when measuring supply current

■ Waveforms

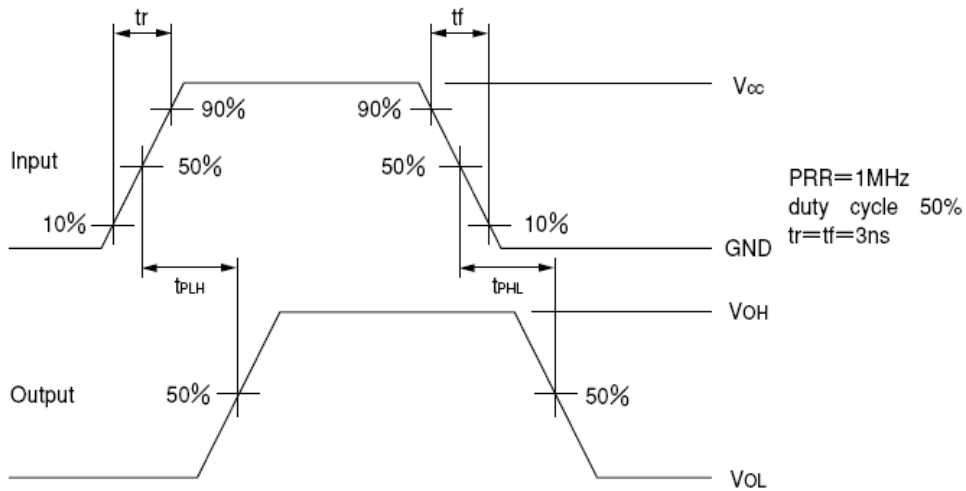


■ Typical Application Circuit



Note: Open output when measuring supply current

■ Waveforms



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