



U74LVC1G19

CMOS IC

1-OF-2 DECODER/DEMULTIPLEXER

DESCRIPTION

The **U74LVC1G19** is a 1-of-2 decoder / demultiplexer with a common output enable. This device buffers the data on input A and passes it to the outputs 1Y and 2Y when the enable input signal is LOW.

This device is fully specified for partial power-down applications using loff. The loff circuitry disables the outputs, preventing the damaging backflow current through the device when it is powered down.

FEATURES

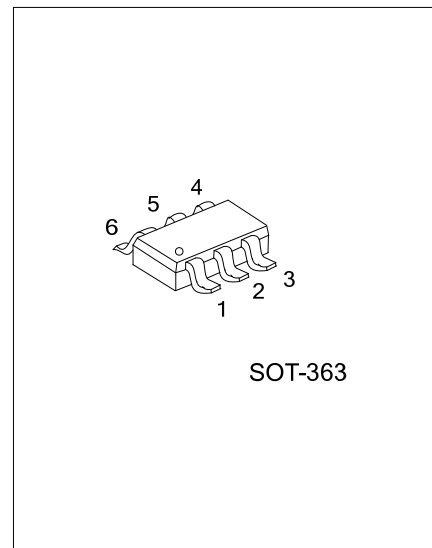
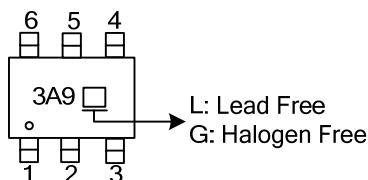
- * Operate from 1.65V to 5.5V
- * Inputs accept voltages to 5.5V
- * Low power dissipation, $I_{CC}=10\mu A$ (Max)
- * $\pm 24mA$ output drive($V_{CC}=3V$)

ORDERING INFORMATION

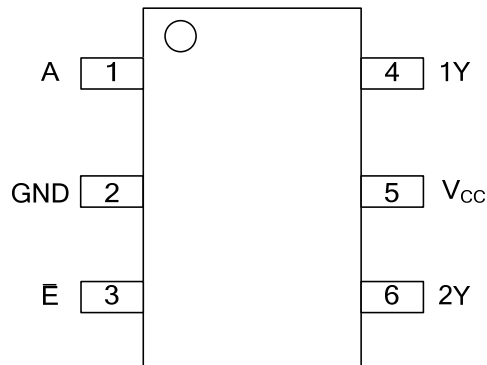
| Ordering Number | | Package | Packing |
|-------------------|-------------------|---------|-----------|
| Lead Free | Halogen Free | | |
| U74LVC1G19L-AL6-R | U74LVC1G19G-AL6-R | SOT-363 | Tape Reel |

| | |
|---|--|
| <p>U74LVC1G19G-AL6-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p> | <p>(1) R: Tape Reel</p> <p>(2) AL6: SOT-363</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|---|--|

MARKING



■ PIN CONFIGURATION



■ PIN DESCRIPTION

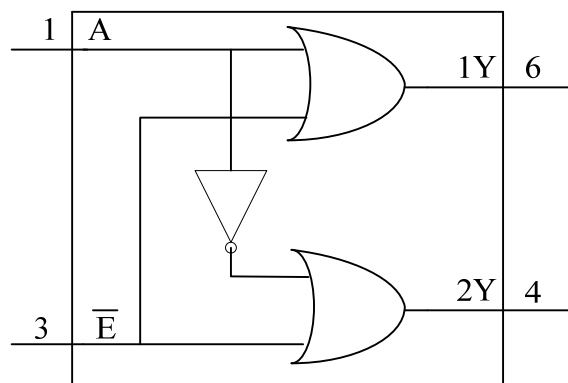
| SYMBOL | PIN | DESCRIPTION |
|-----------|-----|----------------|
| A | 1 | Data input |
| GND | 2 | Ground(0V) |
| \bar{E} | 3 | Enable input |
| 2Y | 4 | Data output |
| Vcc | 5 | Supply voltage |
| 1Y | 6 | Data output |

■ FUNCTION TABLE

| INPUT | | OUTPUT | |
|-----------|---|--------|----|
| \bar{E} | A | 1Y | 2Y |
| L | L | L | H |
| L | H | H | L |
| H | X | H | H |

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

■ LOGIC DIAGRAM (positive logic)



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|-----------|---------------------|------|
| Supply Voltage | | V_{CC} | -0.5 ~ +6.5 | V |
| Input Voltage | | V_{IN} | -0.5 ~ +6.5 | V |
| Output Voltage | Output in the high or low state | V_{OUT} | -0.5 ~ $V_{CC}+0.5$ | V |
| | Output in the high-impedance or power-off state | | -0.5 ~ +6.5 | V |
| V_{CC} or GND Current | | I_{CC} | ±100 | mA |
| Continuous Output Current ($V_{OUT}=0$ to V_{CC}) | | I_{OUT} | ±50 | mA |
| Input Clamp Current ($V_{IN}<0$) | | I_{IK} | -50 | mA |
| Output Clamp Current ($V_{OUT}<0$) | | I_{OK} | -50 | mA |
| Storage Temperature Range | | 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.

■ RECOMMENDED OPERATING CONDITIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------------------------|---------------------|--------------------------------------|------|-----|----------|------|
| Supply Voltage | V_{CC} | Operating | 1.65 | | 5.5 | V |
| Input Voltage | V_{IN} | | 0 | | 5.5 | V |
| Output Voltage | V_{OUT} | High or low state | 0 | | V_{CC} | V |
| Operating Temperature | T_A | | -40 | | 85 | °C |
| Input Transition Rise or Fall Rate | $\Delta t/\Delta v$ | $V_{CC}=1.8V\pm 0.15V, 2.5V\pm 0.2V$ | | | 20 | ns/V |
| | | $V_{CC}=3.0V\pm 0.3V$ | | | 10 | ns/V |
| | | $V_{CC}=5V\pm 0.5V$ | | | 5 | ns/V |

■ ELECTRICAL CHARACTERISTICS (T_A =25°C , unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|----------------------|---|----------------------|------|----------------------|------|
| High-level Input Voltage | V _{IH} | V _{CC} =1.65V ~ 1.95V | 0.65*V _{CC} | | | V |
| | | V _{CC} =2.3V ~ 2.7V | 1.7 | | | V |
| | | V _{CC} =2.7V ~ 3.6V | 2 | | | V |
| | | V _{CC} =4.5V ~ 5.5V | 0.7*V _{CC} | | | V |
| Low-level Input Voltage | V _{IL} | V _{CC} =1.65V ~ 1.95V | | | 0.35*V _{CC} | V |
| | | V _{CC} =2.3V ~ 2.7V | | | 0.7 | V |
| | | V _{CC} =2.7V ~ 3.6V | | | 0.8 | V |
| | | V _{CC} =4.5V ~ 5.5V | | | 0.3*V _{CC} | V |
| High-Level Output Voltage | V _{OH} | V _{CC} =1.65 ~ 5.5V I _{OH} =-100μA | V _{CC} -0.1 | | | V |
| | | V _{CC} =1.65V I _{OH} =-4mA | 1.2 | 1.54 | | V |
| | | V _{CC} =2.3V I _{OH} =-8mA | 1.9 | 2.15 | | V |
| | | V _{CC} =3.0V I _{OH} =-16mA | 2.4 | 2.50 | | V |
| | | V _{CC} =3.0V I _{OH} =-24mA | 2.3 | 2.62 | | V |
| | | V _{CC} =4.5V I _{OH} =-32mA | 3.8 | 4.11 | | V |
| Low-Level Output Voltage | V _{OL} | V _{CC} =1.65 ~ 5.5V I _{OL} =100μA | | | 0.1 | V |
| | | V _{CC} =1.65V I _{OL} =4mA | | 0.07 | 0.45 | V |
| | | V _{CC} =2.3V I _{OL} =8mA | | 0.12 | 0.30 | V |
| | | V _{CC} =2.7V I _{OL} =16mA | | 0.17 | 0.40 | V |
| | | V _{CC} =3.0V I _{OL} =24mA | | 0.33 | 0.55 | V |
| | | V _{CC} =4.5V I _{OL} =32mA | | 0.39 | 0.55 | V |
| Input Leakage Current | I _{I(LEAK)} | V _{IN} =5.5V or GND, V _{CC} =0 ~ 5.5V | | ±0.1 | ±1 | μA |
| Power OFF Leakage Current | I _{off} | V _{IN} or V _{OUT} =5.5V, V _{CC} =0V | | ±0.1 | ±10 | μA |
| Quiescent Supply Current | I _{CC} | V _{IN} =5.5V or GND, I _{OUT} =0 V _{CC} =1.65 ~ 5.5V | | 0.1 | 10 | μA |
| Additional Quiescent Supply Current Per Input Pin | ΔI _{CC} | V _{CC} =2.3 ~ 5.5V, One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND | | 5 | 500 | μA |
| Input Capacitance | C _I | V _{CC} =3.3V, V _{IN} =V _{CC} or GND | | 3.5 | | pF |

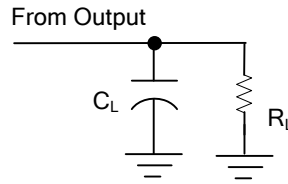
■ SWITCHING CHARACTERISTICS (T_A=25°C)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|------------------------------------|---|-----|-----|------|------|
| Propagation delay from input (A or E) to output(Y) | t _{PLH} /t _{PHL} | V _{CC} =1.8V±0.15V, C _L =30 pF R _U =1KΩ | 3.2 | 4.0 | 16.1 | ns |
| | | V _{CC} =2.5V±0.2V, C _L =30pF R _C =500Ω | 1.5 | 2.5 | 65 | ns |
| | | V _{CC} =3.3V±0.3V, C _L =50 pF R _C =500Ω | 1.1 | 2.5 | 5.2 | ns |
| | | V _{CC} =5V±0.5V, C _L =50pF R _C =500Ω | 0.5 | 1.8 | 3.9 | ns |

■ OPERATING CHARACTERISTICS (T_A=25°C)

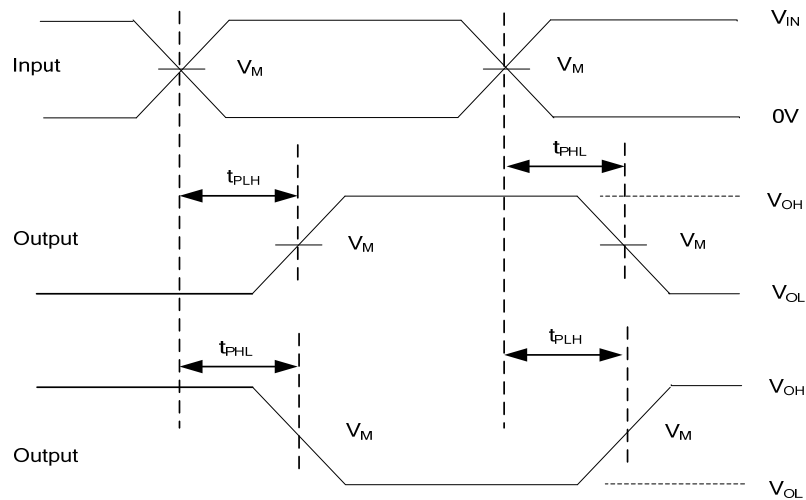
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-------------------------------|-----------------|---|-----|-----|-----|------|
| Power Dissipation Capacitance | C _{PD} | V _I = GND to V _{CC} , V _{CC} =3.3V | | 16 | | pF |

■ TEST CIRCUIT AND WAVEFORMS



TEST CIRCUIT

| V_{CC} | Inputs | | V_M | C_L | R_L |
|------------------|----------|--------------|------------|-------|--------------|
| | V_{IN} | t_R, t_F | | | |
| $1.8V \pm 0.15V$ | V_{CC} | $\leq 2ns$ | $V_{CC}/2$ | 30pF | 1K Ω |
| $2.5V \pm 0.2V$ | V_{CC} | $\leq 2ns$ | $V_{CC}/2$ | 30pF | 500 Ω |
| $3.3V \pm 0.3V$ | 2.7V | $\leq 2.5ns$ | 1.5V | 50pF | 500 Ω |
| $5V \pm 0.5V$ | V_{CC} | $\leq 2.5ns$ | $V_{CC}/2$ | 50pF | 500 Ω |



PROPAGATION DELAY TIMES

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: PRR $\leq 10MHz$, $Z_o = 50\Omega$.

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