



U74LVC2G07

CMOS IC

BUFFERS WITH OPEN-DRAIN OUTPUTS

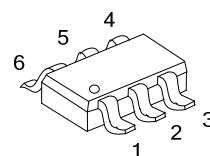
■ DESCRIPTION

The **U74LVC2G07** provides two non-inverting buffers with open-drain output and can be connected to other open-drain outputs to implement active-LOW wired-OR or active-HIGH wired-AND functions.

This device has power-down protective circuit to preventing device from destruction when it is powered down.

■ FEATURES

- * Wide Supply Voltage Range From 1.65V To 5.5V.
- * Inputs Can Be Driven From Either 3.3V or 5V Devices.
- * Low Power Dissipation: $P_{tot} = 300mW(Max)$
- * -24mA Output Drive($V_{CC}=3.0V$)
- * Power Down Protection
- * Latch-Up Performance Exceeds 250mA.
- * High Noise Immunity
- * Direct Interface With TTL Levels



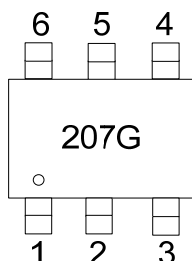
SOT-363

■ ORDERING INFORMATION

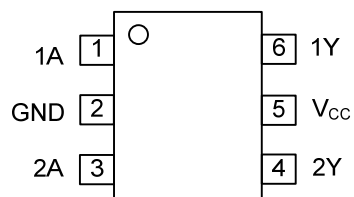
Ordering Number	Package	Packing
U74LVC2G07G-AL6-R	SOT-363	Tape Reel

U74LVC2G07G-AL6-R	(1)Packing Type (2)Package Type (3)Halogen Free	(1) R: Tape Reel (2) AL6: SOT-363 (3) G: Halogen Free
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■ MARKING



■ PIN CONFIGURATION

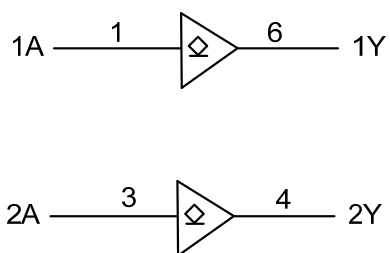


■ FUNCTION TABLE (Each Gate)

INPUT(nA)	OUTPUT(nY)
H	Z
L	L

Note: H = HIGH voltage level
 L = LOW voltage level
 Z = High-impedance OFF-state

■ LOGIC DIAGRAM (Positive Logic)



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~6.5	V
Input Voltage	V_{IN}	-0.5~6.5	V
Output Voltage(Active Mode)	V_{OUT}	-0.5~6.5	V
Output Voltage(Power-Down Mode)	V_{OUT}	-0.5~6.5	V
Input Clamp Current($V_{IN}<0$)	I_{IK}	-50	mA
Output Clamp Current($V_{OUT}<0$)	I_{OK}	-50	mA
Output Current	I_{OUT}	±50	mA
V_{CC} or GND Current	I_{CC}	±100	mA
Operating Ambient Temperature	T_{OPR}	-40 ~ +125	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: 1. 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.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

3. When $V_{CC}=0V$ (Power-Down Mode),the output voltage can be 5.5V in normal operation.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	1.65		5.5	V
Input Voltage	V_{IN}	0		5.5	V
Output Voltage	Active Mode	0		V_{CC}	V
	$V_{CC}=0V$; Power-Down Mode	0		5.5	

■ STATIC CHARACTERISTICS ($T_{OPR} = -40^{\circ}C$ to $+85^{\circ}C$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=1.65V\sim1.95V$	$0.65 \cdot V_{CC}$			V
		$V_{CC}=2.3V\sim2.7V$	1.7			
		$V_{CC}=3.0V\sim3.6V$	2.0			
		$V_{CC}=4.5V\sim5.5V$	$0.7 \cdot V_{CC}$			
Low-Level Input Voltage	V_{IL}	$V_{CC}=1.65V\sim1.95V$			$0.35 \cdot V_{CC}$	V
		$V_{CC}=2.3V\sim2.7V$			0.7	
		$V_{CC}=3.0V\sim3.6V$			0.8	
		$V_{CC}=4.5V\sim5.5V$			$0.3 \cdot V_{CC}$	
Low-Level Output Voltage	V_{OL}	$V_{CC}=1.65V \sim 5.5V, I_{OL}=100\mu A$			0.1	V
		$V_{CC}=1.65V, I_{OL}=4mA$			0.45	
		$V_{CC}=2.3V, I_{OL}=8mA$			0.3	
		$V_{CC}=2.7V, I_{OL}=12mA$			0.4	
		$V_{CC}=3.0V, I_{OL}=24mA$			0.55	
		$V_{CC}=4.5V, I_{OL}=32mA$			0.55	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=1.65V \sim 5.5V, V_{IN}=5.5V$ or 0		±0.1	±5	μA
Power OFF Leakage Current	I_{OFF}	$V_{CC}=0V, V_{IN}$ or $V_O=5.5V$		±0.1	±10	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$		0.1	10	μA
Additional Quiescent Supply Current per pin	ΔI_Q	$V_{CC}=2.3V \sim 5.5V, V_{IN}=V_{CC}-0.6V, I_O=0A$		5	500	μA
Output OFF-state current	I_{OZ}	$V_{CC}=5.5V, V_{IN}=V_{IH}$ or V_{IL} $V_O = V_{CC}$ or GND		±0.1	±10	μA

■ DYNAMIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
$T_{OPR} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ (note)						
Propagation delay from input (nA) to output(nY)	t_{PLZ}/t_{PZL}	$V_{CC} = 1.65 \sim 1.95$	1.0	3.5	6.7	ns
		$V_{CC} = 2.3 \sim 2.7$	0.5	2.4	4.3	
		$V_{CC} = 2.7$	1.0	2.3	4.3	
		$V_{CC} = 3.0 \sim 3.6$	0.5	2.6	3.7	
		$V_{CC} = 4.5 \sim 5.5$	0.5	1.5	2.9	

Note: All typical values are measured at $T_{OPR} = 25^{\circ}\text{C}$ and at $V_{CC} = 1.8\text{V}$, 2.5V , 2.7V , 3.3V and 5.0V respectively.

■ OPERATING CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$)

PARAMETER	SYMBOL	TEST CONDITIONS	TYP	UNIT
Power Dissipation Capacitance Per Gate	C_{PD}	$V_{CC} = 3.3\text{V}$ (Notes 1, 2)	6.5	pF
Input Capacitance	C_I		2.5	pF

Notes: 1. C_{PD} is used to determine the dynamic power dissipation (PD in μW).

$$PD = C_{PD} * V_{CC}^2 * f_i * N + \sum (C_L * V_{CC}^2 * f_o) \text{ where:}$$

f_i = Input Frequency in MHz;

f_o = Output Frequency in MHz;

C_L = Output Load Capacitance in PF;

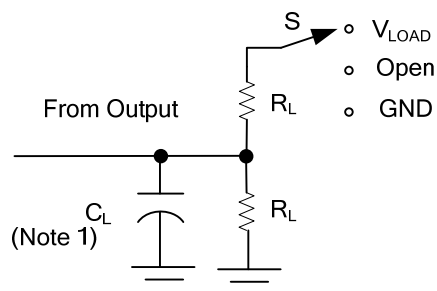
V_{CC} = Supply Voltage in Volts;

N = Total Load Switching Outputs.

$\sum (C_L * V_{CC}^2 * f_o)$ = Sum of Outputs.

2. The Condition is $V_{IN} = \text{GND to } V_{CC}$.

■ TEST CIRCUIT AND WAVEFORMS

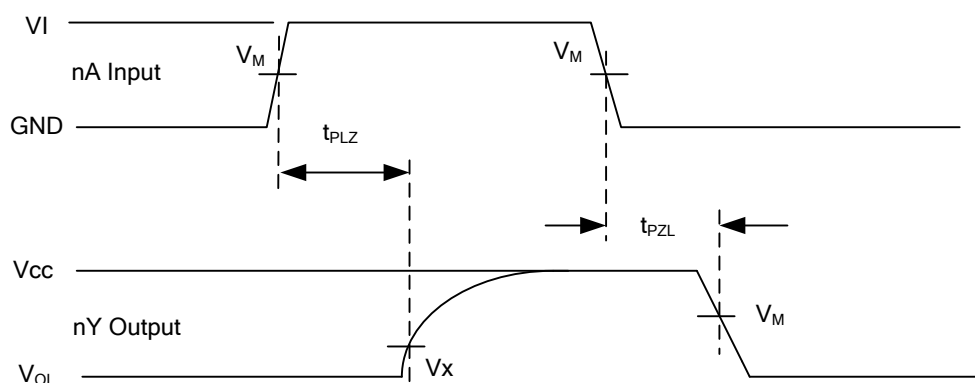


TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{LOAD}

Note 1: C_L includes probe and jig capacitance.

V_{CC}	V_{IN}	t_R / t_F	V_M	V_{LOAD}	C_L	R_L	V_x
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 * V_{CC}$	30pF	1K Ω	$V_{OL} + 0.15V$
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 * V_{CC}$	30pF	500 Ω	$V_{OL} + 0.15V$
2.7V	2.7V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	$V_{OL} + 0.3V$
$3.3V \pm 0.3V$	3 V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	$V_{OL} + 0.3V$
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 * V_{CC}$	50pF	500 Ω	$V_{OL} + 0.3V$

Note: $V_{\Delta} = V_x - V_{OL}$



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