



U74AUP1G07

CMOS IC

LOW-POWER BUFFER WITH OPEN-DRAIN OUTPUT

DESCRIPTION

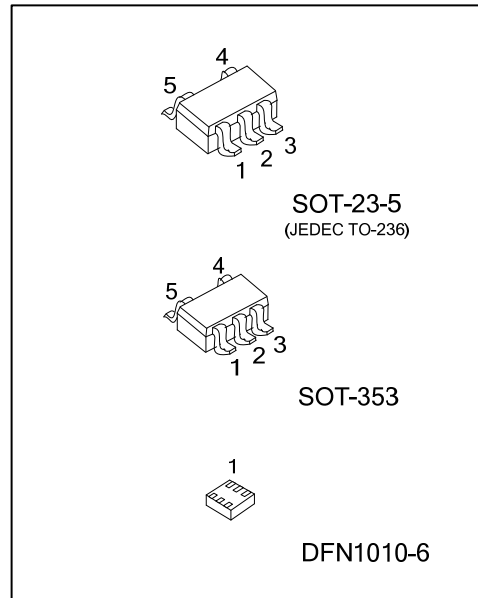
The **U74AUP1G07** provides the single non-inverting buffer with open-drain output. The output of the device is an open drain and can be connected to other open-drain outputs to implement active-LOW wire-OR active-HIGH wire-AND functions.

This device ensures a very low static and dynamic power consumption across the entire V_{CC} range from 0.8V to 3.6V.

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

FEATURES

- * Wide supply voltage range from 0.8V to 3.6V
- * Inputs accept voltages up to 3.6V
- * I_{OFF} supports partial-power-down mode
- * Low static power consumption; $I_{CC}=0.5\mu A$ (Max.)
- * Optimized for 3.3V Operation



ORDERING INFORMATION

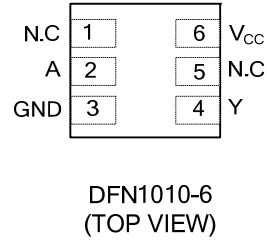
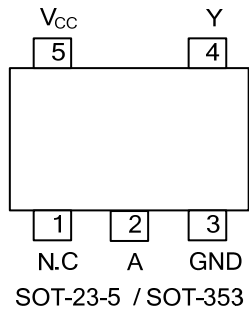
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AUP1G07L-AE5-R	U74AUP1G07G-AE5-R	SOT-23-5	Tape Reel
U74AUP1G07L-AL5-R	U74AUP1G07G-AL5-R	SOT-353	Tape Reel
U74AUP1G07L-K06-1010-R	U74AUP1G07G-K06-1010-R	DFN1010-6	Tape Reel

<p>U74AUP1G07G-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, AL5: SOT-353, K06-1010: DFN1010-6 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
---	--

MARKING

SOT-23-5 / SOT-353	DFN1010-6
<p>P07</p>	<p>P7</p>

■ PIN CONFIGURATION

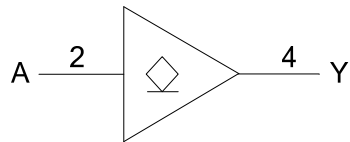


■ FUNCTION TABLE (each gate)

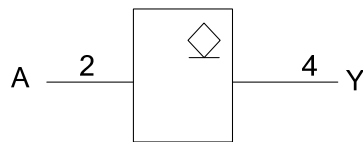
INPUT (A)	OUTPUT (Y)
L	L
H	Z

Note: H: HIGH voltage level; L: LOW voltage level; Z: high impedance state.

■ LOGIC DIAGRAM (positive logic)



Logic symbol



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +4.6	V
Input Voltage	V_{IN}		-0.5 ~ +4.6	V
Output Voltage	V_{OUT}	Output in the high or low state	-0.5 ~ $V_{CC} + 0.5$	V
		Output in the power-off state	-0.5 ~ +4.6	V
Continuous V_{CC} or GND Current	I_{CC}		±50	mA
Continuous Output Current	I_{OUT}	$V_{OUT}=0 \sim V_{CC}$	±20	mA
Input Clamp Current	I_{IK}	$V_{IN}<0$	-50	mA
Output Clamp Current	I_{OK}	$V_{OUT} > V_{CC}$ or $V_{OUT} < 0$	-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	0.8		3.6	V
Input Voltage	V_{IN}		0		3.6	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	$\Delta t/\Delta v$	$V_{CC}=0.8V \sim 3.6V$			200	ns/V

■ STATIC CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
HIGH-level Input Voltage	V_{IH}	$V_{CC}=0.8V$	$0.7 \times V_{CC}$			V	
		$V_{CC}=0.9V \sim 1.95V$	$0.65 \times V_{CC}$			V	
		$V_{CC}=2.3V \sim 2.7V$	1.6			V	
		$V_{CC}=3V \sim 3.6V$	2.0			V	
LOW-level Input Voltage	V_{IL}	$V_{CC}=0.8V$			$0.3 \times V_{CC}$	V	
		$V_{CC}=0.9V \sim 1.95V$			$0.35 \times V_{CC}$	V	
		$V_{CC}=2.3V \sim 2.7V$			0.7	V	
		$V_{CC}=3V \text{ to } 3.6V$			0.9	V	
Low-Level Output Voltage	V_{OL}	$V_{CC}=0.8V \sim 3.6V, I_{OH}=20\mu A$			0.1	V	
		$V_{CC}=1.1V, I_{OH}=1.1mA$			$0.3 \times V_{CC}$	V	
		$V_{CC}=1.4V, I_{OH}=1.7mA$			0.31	V	
		$V_{CC}=1.65V, I_{OH}=1.9mA$			0.31	V	
		$V_{CC}=2.3V$	$I_{OH}=2.3mA$			0.31	V
			$I_{OH}=3.1mA$			0.44	V
$V_{CC}=3V$	$I_{OH}=2.7mA$			0.31	V		
	$I_{OH}=4mA$			0.44	V		
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0V \sim 3.6V, V_{IN}=V_{CC}$ or GND			±0.1	μA	
OFF-State Output Current	I_{OZ}	$V_{CC}=0V \sim 3.6V, V_{IN}=V_{IH}, V_O=0V \sim 3.6V$			±0.1	μA	
Power OFF Leakage Current	I_{OFF}	$V_{CC}=0V, V_{IN}$ or $V_O=0V \sim 3.6V$			±0.2	μA	
Additional Power-off Leakage Current	ΔI_{OFF}	$V_{CC}=0V \sim 0.2V, V_{IN}$ or $V_O=0V \sim 3.6V$			±0.2	μA	
Quiescent Supply Current	I_{CC}	$V_{CC}=0.8V \sim 3.6V, V_{IN}=V_{CC}$ or GND $I_{OUT}=0$			0.5	μA	
Additional Quiescent Supply Current	ΔI_{CC}	$V_{CC}=3.3V$, One input at $V_{CC}-0.6V$, Other inputs at V_{CC} or GND			40	μA	
Input Capacitance	C_I	$V_{CC}=0V, V_{IN}=V_{CC}$ or GND		1.5		pF	
		$V_{CC}=3.6V, V_{IN}=V_{CC}$ or GND		1.7		pF	
Output Capacitance	C_{OUT}	$V_{CC}=0V, V_{OUT}=GND$		1.7		pF	

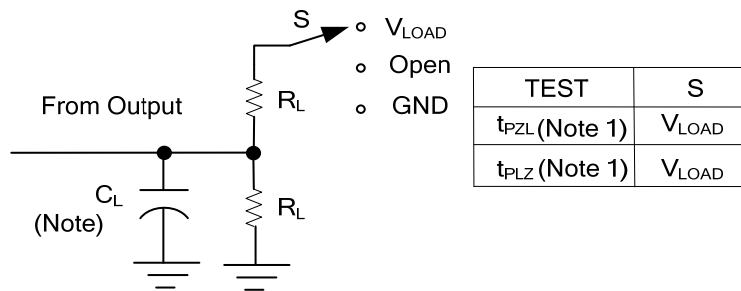
■ DYNAMIC CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
Propagation delay from input (A) to output(Y)	t_{PD}	$C_L = 5\text{pF}$, $R_L = 5\text{K}\Omega$	$V_{CC} = 0.8\text{V}$		12.2		ns	
			$V_{CC} = 1.2\text{V} \pm 0.1\text{V}$	2.1	5.1		ns	
			$V_{CC} = 1.5\text{V} \pm 0.1\text{V}$	1.6	3.6		ns	
			$V_{CC} = 1.8\text{V} \pm 0.15\text{V}$	1.6	3.1		ns	
			$V_{CC} = 2.5\text{V} \pm 0.2\text{V}$	1.1	2.1		ns	
				$V_{CC} = 3.3\text{V} \pm 0.3\text{V}$	1.4	2.2		ns
		$C_L = 10\text{pF}$, $R_L = 5\text{K}\Omega$	$V_{CC} = 0.8\text{V}$			15		ns
			$V_{CC} = 1.2\text{V} \pm 0.1\text{V}$	3	6.2		ns	
			$V_{CC} = 1.5\text{V} \pm 0.1\text{V}$	2.3	4.4		ns	
			$V_{CC} = 1.8\text{V} \pm 0.15\text{V}$	2.4	3.9		ns	
			$V_{CC} = 2.5\text{V} \pm 0.2\text{V}$	1.7	2.8		ns	
				$V_{CC} = 3.3\text{V} \pm 0.3\text{V}$	2.2	3.0		ns
		$C_L = 15\text{pF}$, $R_L = 5\text{K}\Omega$	$V_{CC} = 0.8\text{V}$			18.2		ns
			$V_{CC} = 1.2\text{V} \pm 0.1\text{V}$	3.5	7.3		ns	
			$V_{CC} = 1.5\text{V} \pm 0.1\text{V}$	3	5.2		ns	
			$V_{CC} = 1.8\text{V} \pm 0.15\text{V}$	2.8	4.8		ns	
			$V_{CC} = 2.5\text{V} \pm 0.2\text{V}$	2.4	3.4		ns	
				$V_{CC} = 3.3\text{V} \pm 0.3\text{V}$	2.2	3.7		ns
		$C_L = 30\text{pF}$, $R_L = 5\text{K}\Omega$	$V_{CC} = 0.8\text{V}$			26.5		ns
			$V_{CC} = 1.2\text{V} \pm 0.1\text{V}$	4.8	10.7		ns	
$V_{CC} = 1.5\text{V} \pm 0.1\text{V}$	4.1		7.7		ns			
$V_{CC} = 1.8\text{V} \pm 0.15\text{V}$	3.8		7.5		ns			
$V_{CC} = 2.5\text{V} \pm 0.2\text{V}$	3.7		5.4		ns			
		$V_{CC} = 3.3\text{V} \pm 0.3\text{V}$	3.6	6.3		ns		

■ OPERATING CHARACTERISTICS ($f = 1\text{ MHz}$; $V_I = V_{CC}$ or GND, $T_A = 25^\circ\text{C}$, unless otherwise specified)

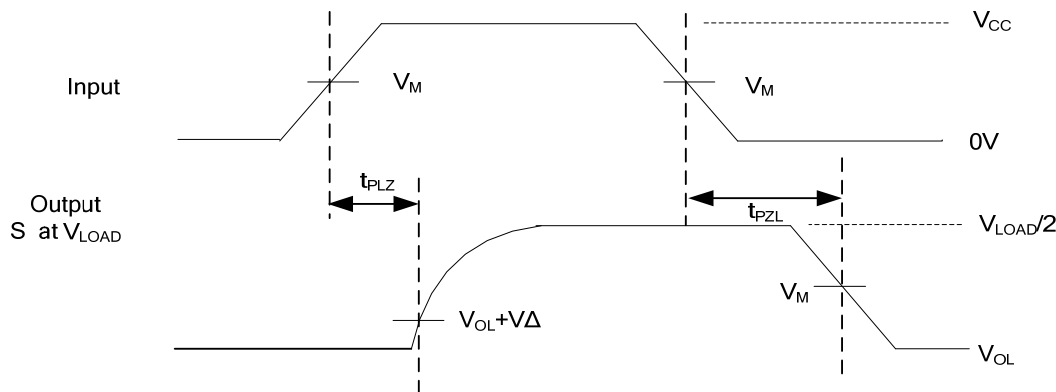
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	$V_{CC} = 0.8\text{V}$		1.0		pF
		$V_{CC} = 1.2\text{V} \pm 0.1\text{V}$		1.0		pF
		$V_{CC} = 1.5\text{V} \pm 0.1\text{V}$		1.0		pF
		$V_{CC} = 1.8\text{V} \pm 0.15\text{V}$		1.0		pF
		$V_{CC} = 2.5\text{V} \pm 0.2\text{V}$		1.0		pF
		$V_{CC} = 3.3\text{V} \pm 0.3\text{V}$		1.0		pF

■ TEST CIRCUIT AND WAVEFORMS



Note: Since this device has open drain outputs, the t_{PLZ} and t_{PZL} is the same as t_{PLH} and t_{PHL} .

V_{CC}	V_{IN}	t_R / t_F	V_M	V_{LOAD}	C_L	R_L	V_{Δ}
0.8	V_{CC}	3ns	$V_{CC}/2$	$2 \times V_{CC}$	5, 10, 15, 30pF	5k Ω	0.1V
$1.2 \pm 0.1V$	V_{CC}	3ns	$V_{CC}/2$	$2 \times V_{CC}$	5, 10, 15, 30pF	5k Ω	0.1V
$1.5 \pm 0.1V$	V_{CC}	3ns	$V_{CC}/2$	$2 \times V_{CC}$	5, 10, 15, 30pF	5k Ω	0.1V
$1.8 \pm 0.15V$	V_{CC}	3ns	$V_{CC}/2$	$2 \times V_{CC}$	5, 10, 15, 30pF	5k Ω	0.15V
$2.5 \pm 0.2V$	V_{CC}	3ns	$V_{CC}/2$	$2 \times V_{CC}$	5, 10, 15, 30pF	5k Ω	0.15V
$3.3 \pm 0.3V$	V_{CC}	3ns	$V_{CC}/2$	$2 \times V_{CC}$	5, 10, 15, 30pF	5k Ω	0.3V



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.