



54ACT/74ACT367 Hex Buffer with TRI-STATE® Outputs

General Description

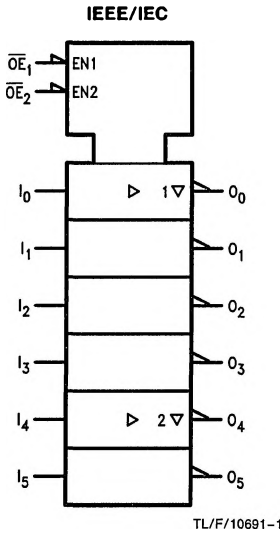
The 'ACT367 contains six independent non-inverting buffers with TRI-STATE outputs.

Features

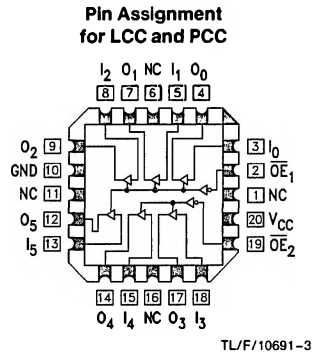
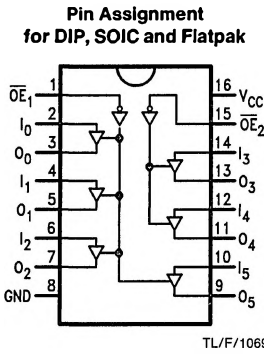
- Outputs source/sink 24 mA
- 'ACT has TTL-compatible inputs

Ordering Code: See Section 8

Logic Symbol



Connection Diagrams



Pin Names	Description
$\overline{OE}_1, \overline{OE}_2$	Output Enable Input (Active LOW)
I_n	Input
O_n	Output

L = LOW Voltage Level
H = HIGH Voltage Level
X = Immaterial
Z = High Impedance

Function Table

Inputs		Outputs
\overline{OE}	I	O
L	L	H
L	H	L
H	X	Z

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage (V_{CC})	-0.5V to +7.0V
DC Input Diode Current (I_{IK})	
$V_I = -0.5V$	-20 mA
$V_I = V_{CC} + 0.5V$	+20 mA
DC Input Voltage (V_I)	-0.5V to $V_{CC} + 0.5V$
DC Output Diode Current (I_{OK})	
$V_O = -0.5V$	-20 mA
$V_O = V_{CC} + 0.5V$	+20 mA
DC Output Voltage (V_O)	-0.5V to $V_{CC} + 0.5V$
DC Output Source or Sink Current (I_O)	±50 mA
DC V_{CC} or Ground Current per Output Pin (I_{CC} or I_{GND})	±50 mA
Storage Temperature (T_{STG})	-65°C to +150°C
Junction Temperature (T_J)	
CDIP	175°C
PDIP	140°C

Note 1: Absolute maximum ratings are values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. National does not recommend operation of FACT™ circuits outside databook specifications.

Recommended Operating Conditions

Supply Voltage (V_{CC})	2.0V to 6.0V
'AC	4.5V to 5.5V
'ACT	
Input Voltage (V_I)	0V to V_{CC}
Output Voltage (V_O)	0V to V_{CC}
Operating Temperature (T_A)	
74AC/ACT	-40°C to +85°C
54AC/ACT	-55°C to +125°C
Minimum Input Edge Rate ($\Delta V/\Delta t$)	
'AC Devices	
V_{IN} from 30% to 70% of V_{CC}	
V_{CC} @3.3V, 4.5V, 5.5V	125 mV/ns
Minimum Input Edge Rate ($\Delta V/\Delta t$)	
'ACT Devices	
V_{IN} from 0.8V to 2.0V	
V_{CC} @4.5V, 5.5V	125 mV/ns

DC Characteristics for 'ACT Family Devices

Symbol	Parameter	V_{CC} (V)	74ACT		54ACT		74ACT		Units	Conditions
			$T_A = +25^\circ\text{C}$		$T_A = -55^\circ\text{C to } +125^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$			
			Typ	Guaranteed Limits						
V_{IH}	Minimum High Level Input Voltage	4.5	1.5	2.0	2.0	2.0	2.0	2.0	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		5.5	1.5	2.0	2.0	2.0	2.0	2.0		
V_{IL}	Maximum Low Level Input Voltage	4.5	1.5	0.8	0.8	0.8	0.8	0.8	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		5.5	1.5	0.8	0.8	0.8	0.8	0.8		
V_{OH}	Minimum High Level Output Voltage	4.5	4.49	4.4	4.4	4.4	4.4	4.4	V	$I_{OUT} = -50 \mu\text{A}$
		5.5	5.49	5.4	5.4	5.4	5.4	5.4		
		4.5		3.86	3.70	3.76			V	* $V_{IN} = V_{IL}$ or V_{IH} -24 mA $I_{OH} = -24 \text{ mA}$
		5.5		4.86	4.70	4.76				
V_{OL}	Maximum Low Level Output Voltage	4.5	0.001	0.1	0.1	0.1	0.1	0.1	V	$I_{OUT} = 50 \mu\text{A}$
		5.5	0.001	0.1	0.1	0.1	0.1	0.1		
		4.5		0.36	0.50	0.44			V	* $V_{IN} = V_{IL}$ or V_{IH} 24 mA $I_{OL} = 24 \text{ mA}$
		5.5		0.36	0.50	0.44	0.44	0.44		
I_{IN}	Maximum Input Leakage Current	5.5		±0.1	±1.0	±1.0	±1.0	μA	$V_I = V_{CC}, \text{GND}$	
I_{OZ}	Maximum TRI-STATE Current	5.5		±0.5	±10.0	±5.0	±5.0	μA	$V_I = V_{IL}, V_{IH}$ $V_O = V_{CC}, \text{GND}$	
I_{CCT}	Maximum I_{CC}/Input	5.5	0.6		1.6	1.5	1.5	mA	$V_I = V_{CC} - 2.1V^{\dagger\dagger}$	
I_{OLD}	†Minimum Dynamic Output Current	5.5			50	75	75	mA	$V_{OLD} = 1.65V \text{ Max}$	
		5.5			-50	-75	-75	mA	$V_{OHD} = 3.85V \text{ Min}$	
I_{CC}	Maximum Quiescent Supply Current	5.5		8.0	160.0	80.0	80.0	μA	$V_{IN} = V_{CC}$ or GND	

*All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

Note: I_{CC} for 54ACT @ 25°C is identical to 74ACT @ 25°C

††May be measured per the JEDEC alternate method.

AC Electrical Characteristics: See Section 2 for Waveforms

Symbol	Parameter	V _{CC} * (V)	74ACT			54ACT		74ACT		Units	Fig. No.
			T _A = +25°C C _L = 50 pF			T _A = -55°C to +125°C C _L = 50 pF		T _A = -40°C to +85°C C _L = 50 pF			
			Min	Typ	Max	Min	Max	Min	Max		
t _{PLH}	Propagation Delay	5.0	1.0	6.5	9.0			1.0	10.0	ns	2-3, 4
t _{PHL}	Propagation Delay	5.0	1.0	6.5	9.0			1.0	10.0	ns	2-3, 4
t _{PZH}	Output Enable Time	5.0	1.0	8.0	10.5			1.0	11.0	ns	2-5
t _{PZL}	Output Enable Time	5.0	1.0	9.5	12.0			1.0	13.0	ns	2-6
t _{PHZ}	Output Disable Time	5.0	1.0	9.5	12.0			1.0	13.0	ns	2-5
t _{PLZ}	Output Disable Time	5.0	1.0	8.0	10.5			1.0	11.5	ns	2-6

*Voltage range 5.0 is 5.0V ± 0.5V.

Capacitance

Symbol	Parameter	Typ	Units	Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = 5.0V
C _{PD}	Power Dissipation Capacitance	45.0	pF	V _{CC} = 5.0V