

# MC74AC240, MC74ACT240

## Octal Buffer/Line Driver with 3-State Outputs

The MC74AC240/74ACT240 is an octal buffer and line driver designed to be employed as a memory address driver, clock driver and bus oriented transmitter or receiver which provides improved PC board density.

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
- Outputs Source/Sink 24 mA
- 'ACT240 Has TTL Compatible Inputs

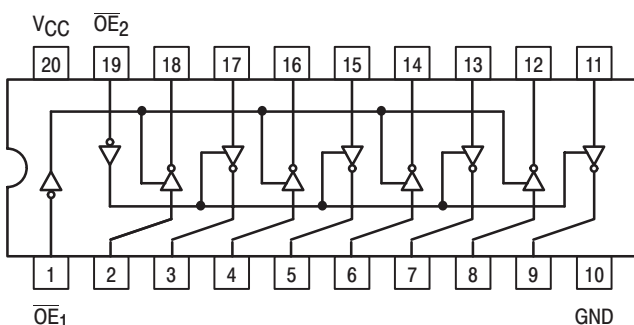


Figure 1. Pinout: 20-Lead Packages Conductors (Top View)

### TRUTH TABLE

Inputs		Outputs
$\overline{OE}_1$	D	(Pins 12, 14, 16, 18)
L	L	H
L	H	L
H	X	Z

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

### TRUTH TABLE

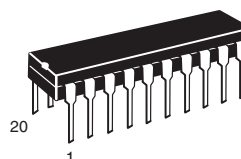
Inputs		Outputs
$\overline{OE}_2$	D	(Pins 3, 5, 7, 9)
L	L	H
L	H	L
H	X	Z

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

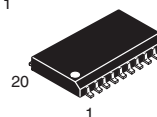


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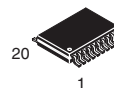
<http://onsemi.com>



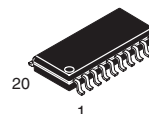
PDIP-20  
N SUFFIX  
CASE 738



SO-20  
DW SUFFIX  
CASE 751



TSSOP-20  
DT SUFFIX  
CASE 948E



EIAJ-20  
M SUFFIX  
CASE 967

### ORDERING INFORMATION

Device	Package	Shipping
MC74AC240N	PDIP-20	18 Units/Rail
MC74ACT240N	PDIP-20	18 Units/Rail
MC74AC240DW	SOIC-20	38 Units/Rail
MC74AC240DWR2	SOIC-20	1000 Tape & Reel
MC74ACT240DW	SOIC-20	38 Units/Rail
MC74ACT240DWR2	SOIC-20	1000 Tape & Reel
MC74AC240DT	TSSOP-20	75 Units/Rail
MC74AC240DTR2	TSSOP-20	2500 Tape & Reel
MC74ACT240DT	TSSOP-20	75 Units/Rail
MC74ACT240DTR2	TSSOP-20	2500 Tape & Reel
MC74AC240M	EIAJ-20	40 Units/Rail
MC74AC240MEL	EIAJ-20	2000 Tape & Reel
MC74ACT240M	EIAJ-20	40 Units/Rail
MC74ACT240MEL	EIAJ-20	2000 Tape & Reel

### DEVICE MARKING INFORMATION

See general marking information in the device marking section on page 181 of this data sheet.

# MC74AC240, MC74ACT240

## MAXIMUM RATINGS\*

Symbol	Parameter	Value	Unit
$V_{CC}$	DC Supply Voltage (Referenced to GND)	-0.5 to +7.0	V
$V_{IN}$	DC Input Voltage (Referenced to GND)	-0.5 to $V_{CC}$ +0.5	V
$V_{OUT}$	DC Output Voltage (Referenced to GND)	-0.5 to $V_{CC}$ +0.5	V
$I_{IN}$	DC Input Current, per Pin	$\pm 20$	mA
$I_{OUT}$	DC Output Sink/Source Current, per Pin	$\pm 50$	mA
$I_{CC}$	DC $V_{CC}$ or GND Current per Output Pin	$\pm 50$	mA
$T_{stg}$	Storage Temperature	-65 to +150	$^{\circ}\text{C}$

\*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Typ	Max	Unit	
$V_{CC}$	Supply Voltage	'AC	2.0	5.0	6.0	V
		'ACT	4.5	5.0	5.5	
$V_{IN}, V_{OUT}$	DC Input Voltage, Output Voltage (Ref. to GND)	0	-	$V_{CC}$	V	
$t_r, t_f$	Input Rise and Fall Time (Note 1) 'AC Devices except Schmitt Inputs	$V_{CC}$ @ 3.0 V	-	150	-	ns/V
		$V_{CC}$ @ 4.5 V	-	40	-	
		$V_{CC}$ @ 5.5 V	-	25	-	
$t_r, t_f$	Input Rise and Fall Time (Note 2) 'ACT Devices except Schmitt Inputs	$V_{CC}$ @ 4.5 V	-	10	-	ns/V
		$V_{CC}$ @ 5.5 V	-	8.0	-	
$T_J$	Junction Temperature (PDIP)	-	-	140	$^{\circ}\text{C}$	
$T_A$	Operating Ambient Temperature Range	-40	25	85	$^{\circ}\text{C}$	
$I_{OH}$	Output Current – High	-	-	-24	mA	
$I_{OL}$	Output Current – Low	-	-	24	mA	

1.  $V_{IN}$  from 30% to 70%  $V_{CC}$ ; see individual Data Sheets for devices that differ from the typical input rise and fall times.
2.  $V_{IN}$  from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

# MC74AC240, MC74ACT240

## DC CHARACTERISTICS

Symbol	Parameter	V <sub>CC</sub> (V)	74AC		74AC	Unit	Conditions
			T <sub>A</sub> = +25°C		T <sub>A</sub> = -40°C to +85°C		
			Typ	Guaranteed Limits			
V <sub>IH</sub>	Minimum High Level Input Voltage	3.0	1.5	2.1	2.1	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
		4.5	2.25	3.15	3.15		
		5.5	2.75	3.85	3.85		
V <sub>IL</sub>	Maximum Low Level Input Voltage	3.0	1.5	0.9	0.9	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
		4.5	2.25	1.35	1.35		
		5.5	2.75	1.65	1.65		
V <sub>OH</sub>	Minimum High Level Output Voltage	3.0	2.99	2.9	2.9	V	I <sub>OUT</sub> = -50 μA
		4.5	4.49	4.4	4.4		
		5.5	5.49	5.4	5.4		
		3.0	-	2.56	2.46	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> -12 mA I <sub>OH</sub> -24 mA -24 mA
		4.5	-	3.86	3.76		
		5.5	-	4.86	4.76		
V <sub>OL</sub>	Maximum Low Level Output Voltage	3.0	0.002	0.1	0.1	V	I <sub>OUT</sub> = 50 μA
		4.5	0.001	0.1	0.1		
		5.5	0.001	0.1	0.1		
		3.0	-	0.36	0.44	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 12 mA I <sub>OL</sub> 24 mA 24 mA
		4.5	-	0.36	0.44		
		5.5	-	0.36	0.44		
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μA	V <sub>I</sub> = V <sub>CC</sub> , GND
I <sub>OZ</sub>	Maximum 3-State Current	5.5	-	±0.5	±5.0	μA	V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub> V <sub>I</sub> = V <sub>CC</sub> , GND V <sub>O</sub> = V <sub>CC</sub> , GND
I <sub>OLD</sub>	†Minimum Dynamic Output Current	5.5	-	-	75	mA	V <sub>OLD</sub> = 1.65 V Max
I <sub>OHD</sub>		5.5	-	-	-75	mA	V <sub>OHD</sub> = 3.85 V Min
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	-	8.0	80	μA	V <sub>IN</sub> = V <sub>CC</sub> 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<sub>IN</sub> and I<sub>CC</sub> @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V<sub>CC</sub>.

# MC74AC240, MC74ACT240

**AC CHARACTERISTICS** (For Figures and Waveforms – See Section 3 of the ON Semiconductor FACT Data Book, DL138/D)

Symbol	Parameter	V <sub>CC</sub> * (V)	74AC			74AC		Unit	Fig. No.
			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF			
			Min	Typ	Max	Min	Max		
t <sub>PLH</sub>	Propagation Delay Data to Output	3.3	1.5	6.0	8.0	1.0	9.0	ns	3-5
		5.0	1.5	4.5	6.5	1.0	7.0		
t <sub>PHL</sub>	Propagation Delay Data to Output	3.3	1.5	5.5	8.0	1.0	8.5	ns	3-5
		5.0	1.5	4.5	6.0	1.0	6.5		
t <sub>PZH</sub>	Output Enable Time	3.3	1.5	6.0	10.5	1.0	11.0	ns	3-7
		5.0	1.5	5.0	7.0	1.0	8.0		
t <sub>PZL</sub>	Output Enable Time	3.3	1.5	7.0	10.0	1.0	11.0	ns	3-8
		5.0	1.5	5.5	8.0	1.0	8.5		
t <sub>PHZ</sub>	Output Disable Time	3.3	1.5	7.0	10.0	1.0	10.5	ns	3-7
		5.0	1.5	6.5	9.0	1.0	9.5		
t <sub>PLZ</sub>	Output Disable Time	3.3	1.5	7.5	10.5	1.0	11.5	ns	3-8
		5.0	1.5	6.5	9.0	1.0	9.5		

\* Voltage Range 3.3 V is 3.3 V ±0.3 V.  
Voltage Range 5.0 V is 5.0 V ±0.5 V.

## DC CHARACTERISTICS

Symbol	Parameter	V <sub>CC</sub> (V)	74ACT		74ACT		Unit	Conditions
			T <sub>A</sub> = +25°C		T <sub>A</sub> = -40°C to +85°C			
			Typ	Guaranteed Limits				
V <sub>IH</sub>	Minimum High Level Input Voltage	4.5	1.5	2.0	2.0	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V	
		5.5	1.5	2.0	2.0			
V <sub>IL</sub>	Maximum Low Level Input Voltage	4.5	1.5	0.8	0.8	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V	
		5.5	1.5	0.8	0.8			
V <sub>OH</sub>	Minimum High Level Output Voltage	4.5	4.49	4.4	4.4	V	I <sub>OUT</sub> = -50 μA	
		5.5	5.49	5.4	5.4			
		4.5	-	3.86	3.76	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> -24 mA I <sub>OH</sub> -24 mA	
		5.5	-	4.86	4.76			
V <sub>OL</sub>	Maximum Low Level Output Voltage	4.5	0.001	0.1	0.1	V	I <sub>OUT</sub> = 50 μA	
		5.5	0.001	0.1	0.1			
		4.5	-	0.36	0.44	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 24 mA I <sub>OL</sub> 24 mA	
		5.5	-	0.36	0.44			
I <sub>IIN</sub>	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μA	V <sub>I</sub> = V <sub>CC</sub> , GND	
ΔI <sub>CCCT</sub>	Additional Max. I <sub>CC</sub> /Input	5.5	0.6	-	1.5	mA	V <sub>I</sub> = V <sub>CC</sub> - 2.1 V	
I <sub>OZ</sub>	Maximum 3-State Current	5.5	-	±0.5	±5.0	μA	V <sub>I</sub> (OE) = V <sub>IL</sub> , V <sub>IH</sub> V <sub>I</sub> = V <sub>CC</sub> , GND V <sub>O</sub> = V <sub>CC</sub> , GND	
I <sub>OLD</sub>	†Minimum Dynamic Output Current	5.5	-	-	75	mA	V <sub>OLD</sub> = 1.65 V Max	
I <sub>OHD</sub>		5.5	-	-	-75	mA	V <sub>OHD</sub> = 3.85 V Min	
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	-	8.0	80	μA	V <sub>IN</sub> = V <sub>CC</sub> 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.

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**AC CHARACTERISTICS** (For Figures and Waveforms – See Section 3 of the ON Semiconductor FACT Data Book, DL138/D)

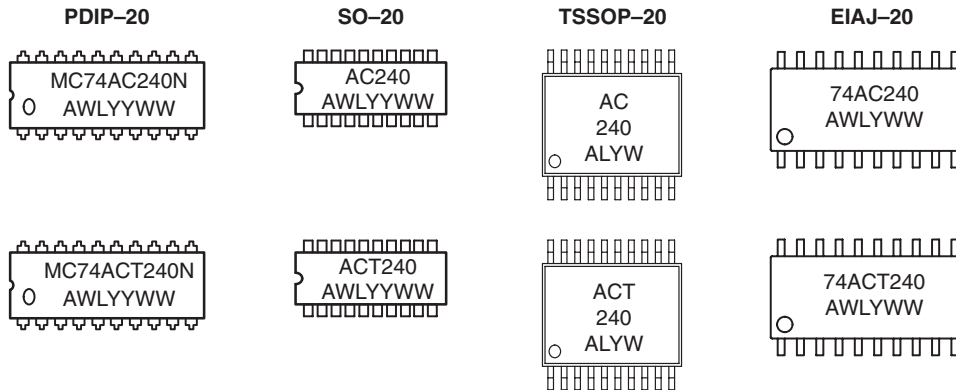
Symbol	Parameter	V <sub>CC</sub> * (V)	74ACT			74ACT		Unit	Fig. No.
			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF			
			Min	Typ	Max	Min	Max		
t <sub>PLH</sub>	Propagation Delay Data to Output	5.0	1.5	6.0	8.5	1.5	9.5	ns	3-5
t <sub>PHL</sub>	Propagation Delay Data to Output	5.0	1.5	5.5	7.5	1.5	8.5	ns	3-5
t <sub>PZH</sub>	Output Enable Time	5.0	1.5	7.0	8.5	1.0	9.5	ns	3-7
t <sub>PZL</sub>	Output Enable Time	5.0	2.0	7.0	9.5	1.5	10.5	ns	3-8
t <sub>PHZ</sub>	Output Disable Time	5.0	2.0	8.0	9.5	2.0	10.5	ns	3-7
t <sub>PLZ</sub>	Output Disable Time	5.0	2.5	6.5	10.0	2.0	10.5	ns	3-8

\*Voltage Range 5.0 V is 5.0 V ±0.5 V.

## CAPACITANCE

Symbol	Parameter	Value Typ	Unit	Test Conditions
C <sub>IN</sub>	Input Capacitance	4.5	pF	V <sub>CC</sub> = 5.0 V
C <sub>PD</sub>	Power Dissipation Capacitance	45	pF	V <sub>CC</sub> = 5.0 V

## MARKING DIAGRAMS



A = Assembly Location  
 WL, L = Wafer Lot  
 YY, Y = Year  
 WW, W = Work Week