

74AC/ACT11241

Octal Buffer/Line Driver; 3-State

Product Specification

ACL Products

FEATURES

- Octal bus interface
- 3-State buffers
- Output capability: ± 24 mA
- CMOS (AC) and TTL (ACT) voltage level inputs
- 50Ω incident wave switching
- Center-pin V_{CC} and ground configuration to minimize high-speed switching noise
- I_{CC} category: MSI

DESCRIPTION

The 74AC/ACT11241 high-performance CMOS devices combine very high speed and high output drive comparable to the most advanced TTL families.

The 74AC/ACT11241 device is an octal buffer that is ideal for driving bus lines or buffer memory address registers. The device features two Output Enables ($1\overline{OE}$ and $2\overline{OE}$), each controlling four of the 3-State outputs.

GENERAL INFORMATION

SYMBOL	PARAMETER	CONDITIONS $T_A = 25^\circ\text{C}; \text{GND} = 0\text{V};$ $V_{CC} = 5.0\text{V}$		UNIT		
		AC	ACT			
t_{PLH}/t_{PHL}	Propagation delay A_n to Y_n	$C_L = 50\text{pF}$		ns		
C_{PD}	Power dissipation capacitance per buffer ¹	$f = 1\text{MHz};$ Enabled	26	27	pF	
		$C_L = 50\text{pF}$ Disabled	10	9		
C_{IN}	Input capacitance	$V_I = 0\text{V}$ or V_{CC}		4.0	4.0	pF
C_{OUT}	Output capacitance	$V_I = 0\text{V}$ or V_{CC} : Disabled		10	10	pF
I_{LATCH}	Latch-up current	Per Jeduc JC40.2 Standard 17		500	500	mA

Note:

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

$$P_D = C_{PD} \times V_{CC}^2 \times f_I + \sum (C_L \times V_{CC}^2 \times f_O) \text{ where:}$$

f_I = input frequency in MHz, C_L = output load capacitance in pF,

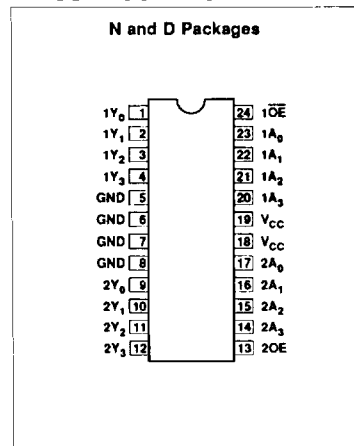
f_O = output frequency in MHz, V_{CC} = supply voltage in V,

$\sum (C_L \times V_{CC}^2 \times f_O)$ = sum of outputs

ORDERING INFORMATION

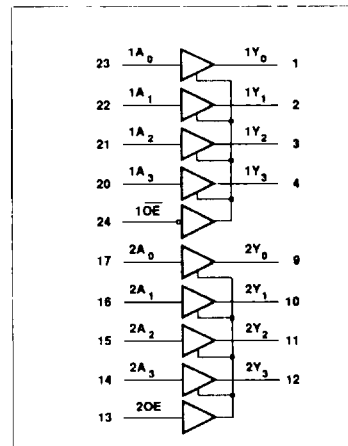
PACKAGES	TEMPERATURE RANGE	ORDER CODE
24-pin plastic DIP (300mil-wide)	-40°C to +85°C	74AC11241N 74ACT11241N
24-pin plastic SO (300mil-wide)	-40°C to +85°C	74AC11241D 74ACT11241D

PIN CONFIGURATION



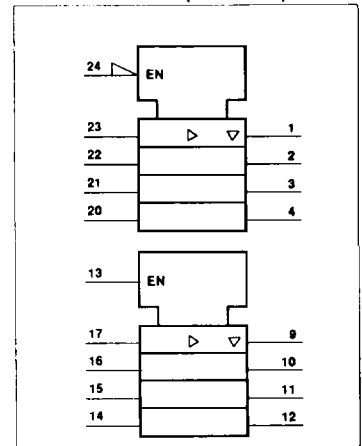
April 14, 1988

LOGIC SYMBOL



5-285

LOGIC SYMBOL (IEEE/IEC)



853-1343 92942

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PIN DESCRIPTION

PIN NUMBER	SYMBOL	NAME AND FUNCTION
23, 22, 21, 20	1A ₀ - 1A ₃	Data inputs
17, 16, 15, 14	2A ₀ - 2A ₃	Data inputs
1, 2, 3, 4	1Y ₀ - 1Y ₃	Data outputs
9, 10, 11, 12	2Y ₀ - 2Y ₃	Data outputs
24, 13	1OE, 2OE	Output enables
5, 6, 7, 8	GND	Ground (0V)
18, 19	V _{CC}	Positive supply voltage

FUNCTION TABLE

INPUTS				OUTPUT	
1OE	1A _n	2OE	2A _n	1Y _n	2Y _n
L	L	H	L	L	L
L	H	H	H	H	H
H	X	L	X	Z	Z

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	74AC11241			74ACT11241			UNIT
		Min	Nom	Max	Min	Nom	Max	
V _{CC}	DC supply voltage	3.0 ¹	5.0	5.5	4.5	5.0	5.5	V
V _I	Input voltage	0		V _{CC}	0		V _{CC}	V
V _O	Output voltage	0		V _{CC}	0		V _{CC}	V
ΔV/Δv	Input transition rise or fall rate	Data	0	10	0		10	ns/V
		Output enable	0	5	0		10	
T _A	Operating free-air temperature	-40		+85	-40		+85	°C

NOTE:

1. No electrical or switching characteristics are specified at V_{CC} < 3V. Operation between 2V and 3V is not recommended, but within that range, a device output will maintain a previously established logic state.

ABSOLUTE MAXIMUM RATINGS¹

SYMBOL	PARAMETER	TEST CONDITIONS	RATING	UNIT
V _{CC}	DC supply voltage		-0.5 to +7.0	V
I _{IK} or V _I	DC input diode current ²	V _I < 0	-20	mA
		V _I > V _{CC}	20	
	DC input voltage		-0.5 to V _{CC} +0.5	V
I _{OK} or V _O	DC output diode current ²	V _O < 0	-50	mA
		V _O > V _{CC}	50	
	DC output voltage		-0.5 to V _{CC} +0.5	V
I _O	DC output source or sink current per output pin	V _O = 0 to V _{CC}	±50	mA
I _{CC} or I _{GND}	DC V _{CC} current		±200	mA
	DC ground current		±200	
T _{STG}	Storage temperature		-65 to 150	°C
P _{TOT}	Power dissipation per package Plastic DIP	Above 70°C: derate linearly by 8mW/K	500	mW
	Power dissipation per package Plastic surface mount (SO)	Above 70°C: derate linearly by 6mW/K	400	mW

NOTES:

- Stresses beyond those listed may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

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DC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITIONS	V _{CC}	74AC11241				74ACT11241				UNIT		
				T _A = +25°C		T _A = -40°C to +85°C		T _A = +25°C		T _A = -40°C to +85°C				
				Min	Max	Min	Max	Min	Max	Min	Max			
V _{IH}	High-level input voltage		3.0	2.10		2.10						V		
			4.5	3.15		3.15		2.0		2.0				
			5.5	3.85		3.85		2.0		2.0				
V _{IL}	Low-level input voltage		3.0		0.90		0.90					V		
			4.5		1.35		1.35		0.8		0.8			
			5.5		1.65		1.65		0.8		0.8			
V _{OH}	High-level output voltage	V _I = V _{IL} or V _{IH}	I _{OH} = -50μA	3.0	2.9		2.9					V		
				4.5	4.4		4.4		4.4		4.4			
				5.5	5.4		5.4		5.4		5.4			
				I _{OH} = -4mA	3.0	2.58		2.48						
					4.5	3.94		3.8		3.94			3.8	
					5.5	4.94		4.8		4.94			4.8	
I _{OH} = -24mA	3.0													
	5.5			3.85				3.85						
V _{OL}	Low-level output voltage	V _I = V _{IL} or V _{IH}	I _{OL} = 50μA	3.0		0.1		0.1				V		
				4.5		0.1		0.1		0.1			0.1	
				5.5		0.1		0.1		0.1			0.1	
				I _{OL} = 12mA	3.0		0.36		0.44					
					4.5		0.36		0.44		0.36			0.44
					5.5		0.36		0.44		0.36			0.44
I _{OL} = 24mA	3.0													
	5.5				1.65				1.65					
I _{OL} = 75mA ¹	3.0													
	5.5													
I _I	Input leakage current	V _I = V _{CC} or GND	5.5		±0.1		±1.0		±0.1		±1.0	μA		
I _{OZ}	3-State output off-state current	V _I = V _{IH} or V _{IL} V _O = V _{CC} or GND	5.5		±0.5		±5.0		±0.5		±5.0	μA		
I _{CC}	Quiescent supply current	V _I = V _{CC} or GND, I _O = 0	5.5		8.0		80		8.0		80	μA		
ΔI _{CC}	Supply current, TTL inputs High ²	One input at 3.4V, other inputs at V _{CC} or GND	5.5						0.9		1.0	mA		

NOTES:

1. Not more than one output should be tested at a time, and the duration of the test should not exceed 10ms.
2. This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0V or V_{CC}.

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AC ELECTRICAL CHARACTERISTICS AT 3.3V ±0.3V

SYMBOL	PARAMETER	WAVEFORM	74AC11241					UNIT
			T _A = +25°C			T _A = -40°C to +85°C		
			Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation delay A _n to Y _n	1	1.5	7.0	10.0	1.5	11.4	ns
t _{PZH} t _{PZL}	Output enable time to High and Low level	2	1.5	7.8	11.4	1.5	12.9	ns
t _{PHZ} t _{PLZ}	Output disable time from High and Low level	2	1.5	5.8	7.6	1.5	7.9	ns

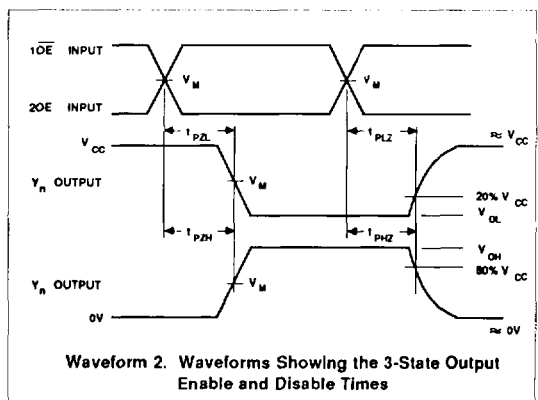
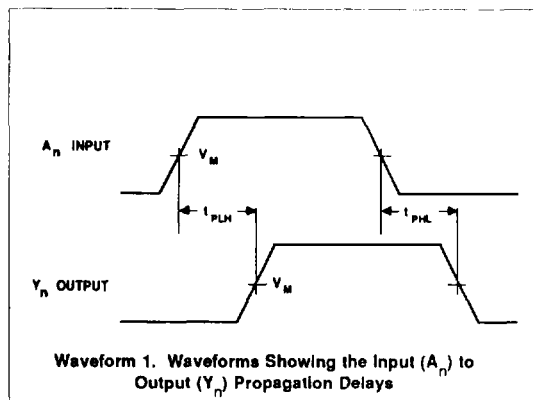
AC ELECTRICAL CHARACTERISTICS AT 5.0V ±0.5V

SYMBOL	PARAMETER	WAVEFORM	74AC11241					UNIT
			T _A = +25°C			T _A = -40°C to +85°C		
			Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation delay A _n to Y _n	1	1.5	4.9	7.1	1.5	8.0	ns
t _{PZH} t _{PZL}	Output enable time to High and Low level	2	1.5	5.4	8.0	1.5	9.0	ns
t _{PHZ} t _{PLZ}	Output disable time from High and Low level	2	1.5	4.9	6.6	1.5	6.9	ns

AC ELECTRICAL CHARACTERISTICS AT 5.0V ±0.5V

SYMBOL	PARAMETER	WAVEFORM	74ACT11241					UNIT
			T _A = +25°C			T _A = -40°C to +85°C		
			Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation delay A _n to Y _n	1	1.5	6.6	9.0	1.5	10.0	ns
t _{PZH} t _{PZL}	Output enable time to High and Low level	2	1.5	7.5	11.3	1.5	12.3	ns
t _{PHZ} t _{PLZ}	Output disable time from High and Low level	2	1.5	7.6	10.6	1.5	11.0	ns

AC WAVEFORMS



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WAVEFORM CONDITIONS

	INPUTS	OUTPUTS
AC	$V_{IN} = \text{GND to } V_{CC}$ $V_M = 50\% V_{CC}$	$V_{OUT} = V_{OL} \text{ to } V_{OH}$
ACT	$V_{IN} = \text{GND to } 3.0V$, $V_M = 1.5V$	$V_M = 50\% V_{CC}$

TEST CIRCUIT

