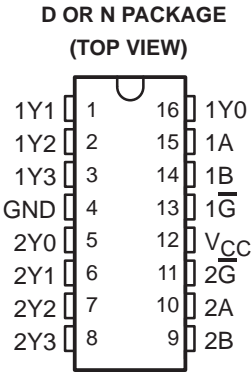


74AC11239

DUAL 2-LINE TO 4-LINE DECODER/DEMULTIPLEXER

SCAS072A – JULY 1989 – REVISED APRIL 1993

- Designed Specifically for High-Speed Memory Decoders and Data Transmission Systems
- Incorporates Two Enable Inputs to Simplify Cascading and/or Data Reception
- Flow-Through Architecture to Optimize PCB Layout
- Center-Pin  $V_{CC}$  and GND Configurations to Minimize High-Speed Switching Noise
- EPIC™ (Enhanced-Performance Implanted CMOS) 1- $\mu$ m Process
- 500-mA Typical Latch-Up Immunity at 125°C
- Package Options Include Plastic Small Outline Packages, and Standard Plastic 300-mil DIPs



description

The 74AC11239 circuit is designed to be used in high-performance memory-decoding or data- routing applications requiring very short propagation delay times. In high-performance memory systems, this decoder can be used to minimize the effects of system decoding. When employed with high-speed memories utilizing a fast enable circuit, the delay times of this decoder and the enable time of the memory are usually less than the typical access time of the memory. This means that the effective system delay introduced by the decoder is negligible.

The 74AC11239 is comprised of two individual two-line to four-line decoders in a single package. The active-low enable input can be used as a data line in demultiplexing applications. These decoders/demultiplexers feature fully buffered inputs, each of which represents only one normalized load to its driving circuit.

The 74AC11239 is characterized for operation from – 40°C to 85°C.

FUNCTION TABLE

ENABLE INPUT $\overline{G}$	SELECT INPUTS		OUTPUTS			
	A	B	Y0	Y1	Y2	Y3
H	X	X	L	L	L	L
L	L	L	H	L	L	L
L	H	L	L	H	L	L
L	L	H	L	L	H	L
L	H	H	L	L	L	H

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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



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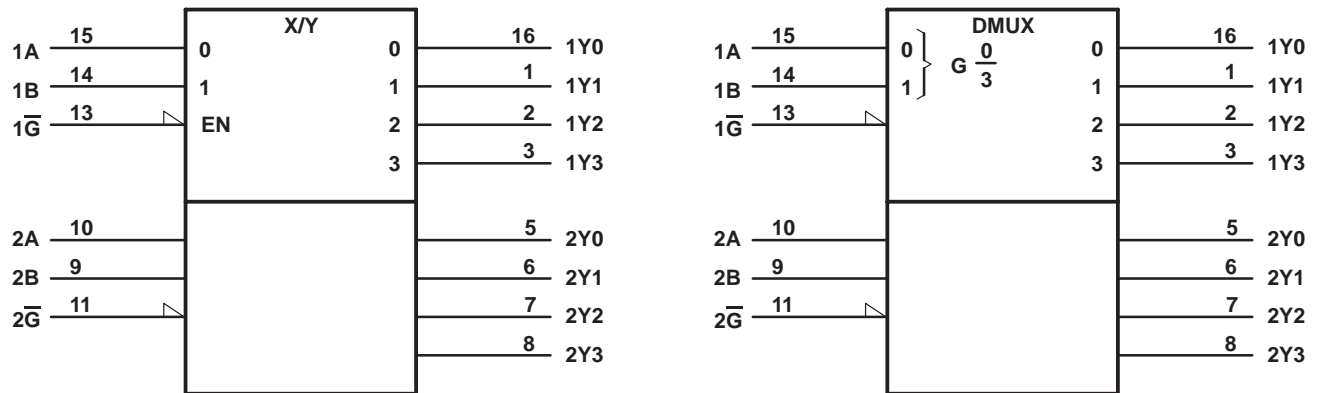
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# 74AC11239

## DUAL 2-LINE TO 4-LINE DECODER/DEMULTIPLEXER

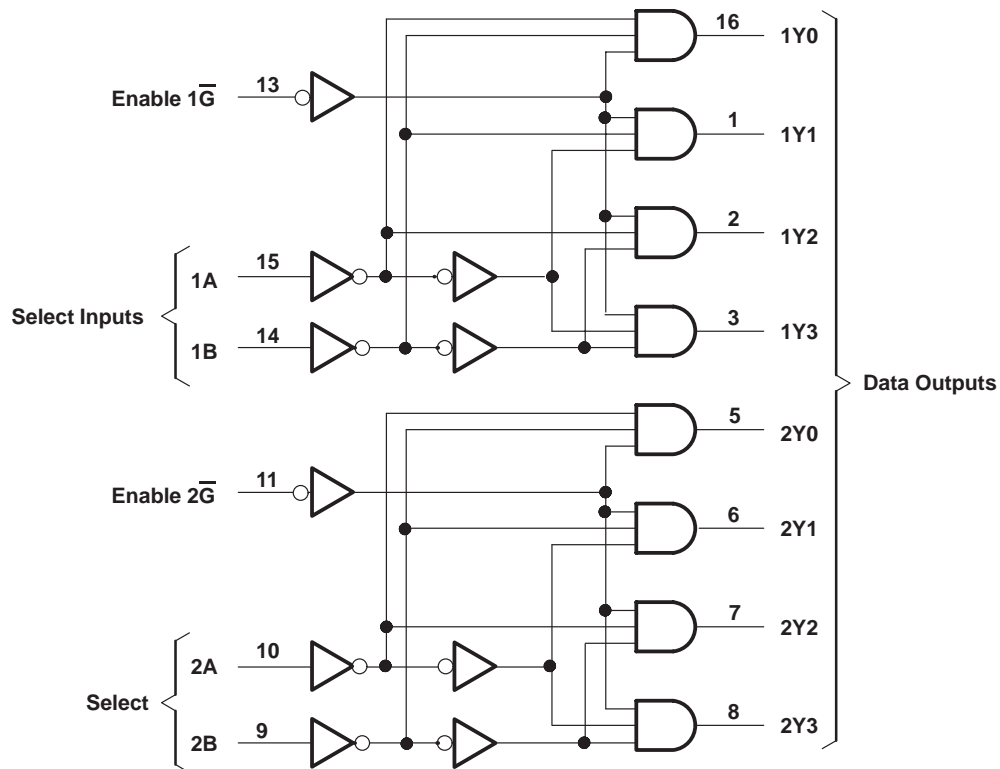
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### logic symbols† (alternatives)



† These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

### logic diagram (positive logic)



**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>**

Supply voltage range, $V_{CC}$	– 0.5 V to 7 V
Input voltage range, $V_I$ (see Note 1)	– 0.5 V to $V_{CC} + 0.5$ V
Output voltage range, $V_O$ (see Note 1)	– 0.5 V to $V_{CC} + 0.5$ V
Input clamp current, $I_{IK}$ ( $V_I < 0$ or $V_I > V_{CC}$ )	$\pm 20$ mA
Output clamp current, $I_{OK}$ ( $V_O < 0$ or $V_O > V_{CC}$ )	$\pm 50$ mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ )	$\pm 50$ mA
Continuous current through $V_{CC}$ or GND	$\pm 200$ mA
Storage temperature range	– 65°C to 150°C

<sup>†</sup> Stresses beyond those listed under “absolute maximum ratings” 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.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

**recommended operating conditions**

		MIN	NOM	MAX	UNIT
$V_{CC}$	Supply voltage	3	5	5.5	V
$V_{IH}$	High-level input voltage	$V_{CC} = 3$ V	2.1		V
		$V_{CC} = 4.5$ V	3.15		
		$V_{CC} = 5.5$ V	3.85		
$V_{IL}$	Low-level input voltage	$V_{CC} = 3$ V		0.9	V
		$V_{CC} = 4.5$ V		1.35	
		$V_{CC} = 5.5$ V		1.65	
$V_I$	Input voltage	0		$V_{CC}$	V
$V_O$	Output voltage	0		$V_{CC}$	V
$I_{OH}$	High-level output current	$V_{CC} = 3$ V		– 4	mA
		$V_{CC} = 4.5$ V		– 24	
		$V_{CC} = 5.5$ V		– 24	
$I_{OL}$	Low-level output current	$V_{CC} = 3$ V		12	mA
		$V_{CC} = 4.5$ V		24	
		$V_{CC} = 5.5$ V		24	
$\Delta t/\Delta v$	Input transition rise or fall rate	0		10	ns/V
$T_A$	Operating free-air temperature	– 40		85	°C

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## DUAL 2-LINE TO 4-LINE DECODER/DEMULTIPLEXER

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**electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)**

PARAMETER	TEST CONDITIONS	V <sub>CC</sub>	T <sub>A</sub> = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
V <sub>OH</sub>	I <sub>OH</sub> = – 50 µA	3 V	2.9			2.9		V
		4.5 V	4.4			4.4		
		5.5 V	5.4			5.4		
	I <sub>OH</sub> = – 4 mA	3 V	2.58			2.48		
		4.5 V	3.94			3.8		
		5.5 V	4.94			4.8		
	I <sub>OH</sub> = – 50 mA <sup>†</sup>	5.5 V						
	I <sub>OH</sub> = – 75 mA <sup>†</sup>	5.5 V				3.85		
V <sub>OL</sub>	I <sub>OL</sub> = 50 µA	3 V			0.1		0.1	V
		4.5 V			0.1		0.1	
		5.5 V			0.1		0.1	
	I <sub>OL</sub> = 12 mA	3 V			0.36		0.44	
		4.5 V			0.36		0.44	
		5.5 V			0.36		0.44	
	I <sub>OL</sub> = 50 mA <sup>†</sup>	5.5 V						
	I <sub>OL</sub> = 75 mA <sup>†</sup>	5.5 V					1.65	
I <sub>I</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5.5 V			± 0.1		± 1	µA
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V			8		80	µA
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V		3.5				pF

<sup>†</sup> Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.

**switching characteristics over recommended operating free-air temperature range, V<sub>CC</sub> = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T <sub>A</sub> = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t <sub>PLH</sub>	A or B	Y	1.5	6.2	8.5	1.5	9.5	ns
t <sub>PHL</sub>			1.5	5.6	8	1.5	9	
t <sub>PLH</sub>	$\overline{G}$	Y	1.5	5.4	7.1	1.5	7.9	ns
t <sub>PHL</sub>			1.5	5.7	7.3	1.5	8.1	

**switching characteristics over recommended operating free-air temperature range, V<sub>CC</sub> = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T <sub>A</sub> = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t <sub>PLH</sub>	A or B	Y	1.5	4	6.1	1.5	6.7	ns
t <sub>PHL</sub>			1.5	3.7	6.1	1.5	6.8	
t <sub>PLH</sub>	$\overline{G}$	Y	1.5	3.5	5.3	1.5	5.8	ns
t <sub>PHL</sub>			1.5	3.9	5.6	1.5	6.2	

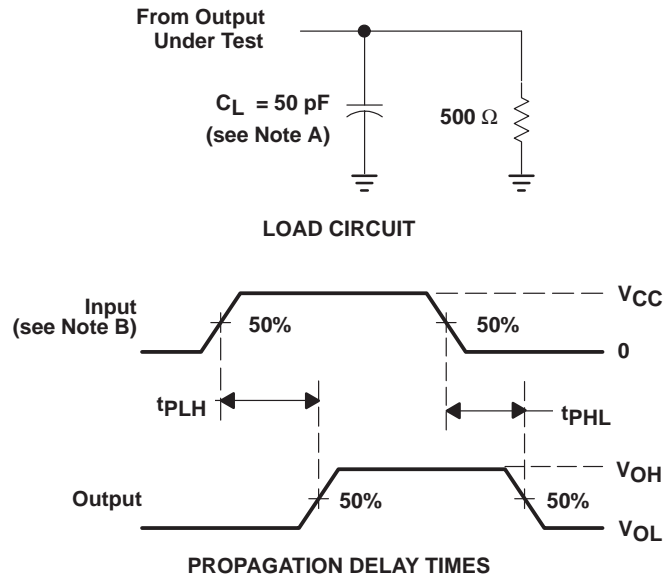
**operating characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C**

PARAMETER	TEST CONDITIONS	TYP	UNIT
C <sub>pd</sub> Power dissipation capacitance	C <sub>L</sub> = 50 pF, f = 1 MHz	48	pF



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## PARAMETER MEASUREMENT INFORMATION



NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. Input pulses are supplied by generators having the following characteristics:  $PRR \leq 10 \text{ MHz}$ ,  $Z_O = 50 \Omega$ ,  $t_r = 3 \text{ ns}$ ,  $t_f = 3 \text{ ns}$ .  
 C. The outputs are measured one at a time with one input transition per measurement.

**Figure 1. Load Circuit and Voltage Waveforms**

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