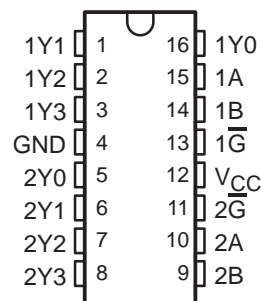


- Designed Specifically for High-Speed Memory Decoders and Data Transmission Systems
- Incorporates Two Enable Inputs to Simplify Cascading and/or Data Reception
- Flow-Through Architecture to Optimize PCB Layout
- Center-Pin  $V_{CC}$  and GND Configurations to Minimize High-Speed Switching Noise
- 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

D OR N PACKAGE  
(TOP VIEW)



## 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  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

FUNCTION TABLE

ENABLE INPUT $\overline{\text{G}}$	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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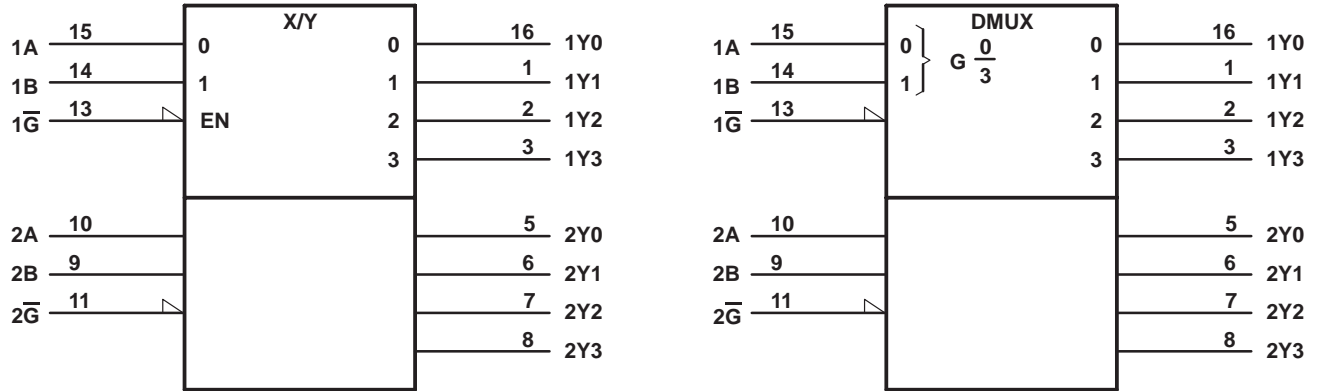
PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



# 74AC11239 DUAL 2-LINE TO 4-LINE DECODER/DEMULTIPLEXER

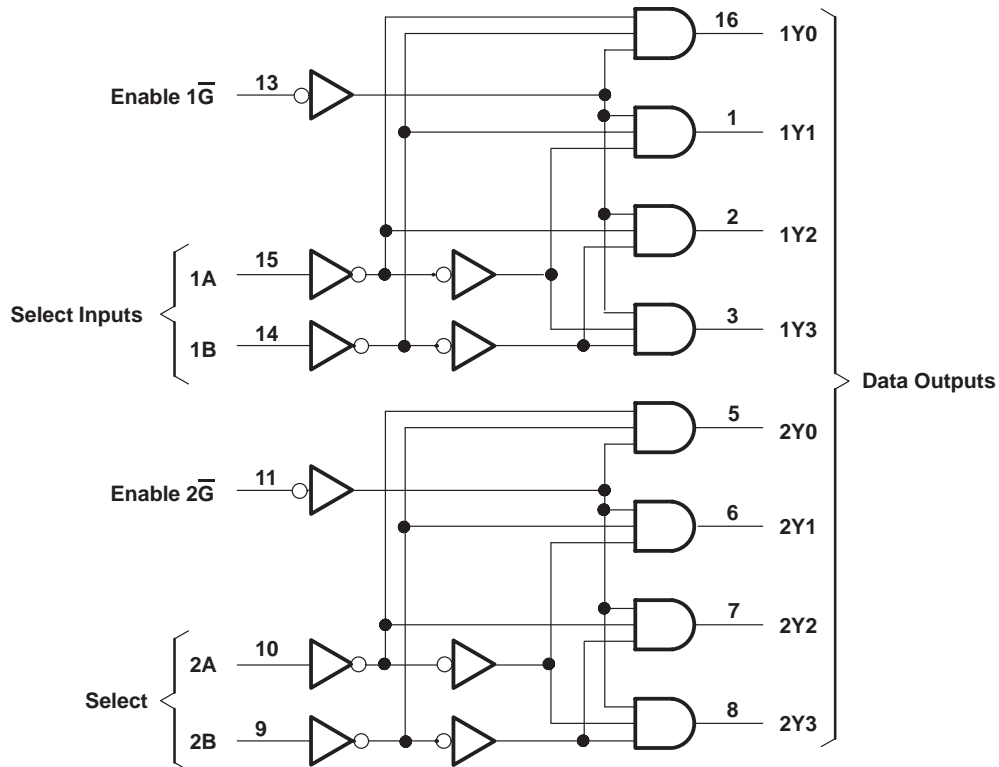
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## logic symbols† (alternatives)



† 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)†**

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

† 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

# 74AC11239

## 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			
		I <sub>OH</sub> = -24 mA	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		V	
		4.5 V				0.1			
		5.5 V				0.1			
	I <sub>OL</sub> = 12 mA	3 V				0.36			
		I <sub>OL</sub> = 24 mA	4.5 V				0.36		
	5.5 V					0.36			
	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		μA	
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V				8		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>	$\bar{G}$	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)

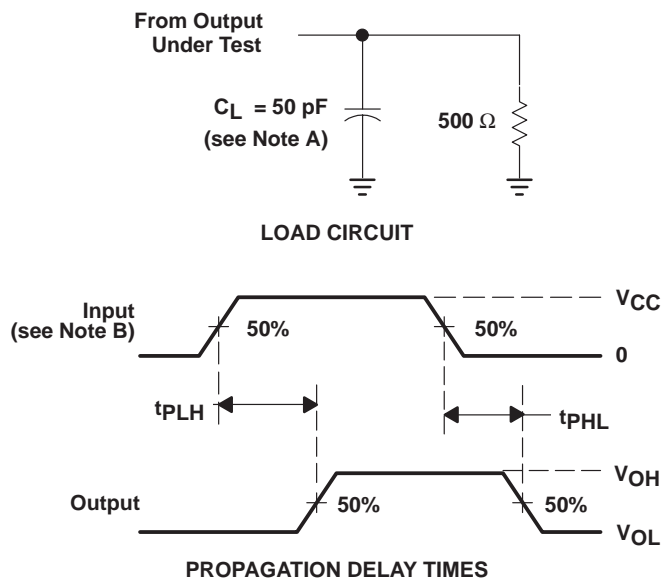
PARAMETER	FROM (INPUT)	TO (OUTPUT)	T <sub>A</sub> = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t <sub>PLH</sub>	A or B	Y	1.5	4	6.1	1.5	6.7	ns
t <sub>PHL</sub>			1.5	3.7	6.1	1.5	6.8	
t <sub>PLH</sub>	$\bar{G}$	Y	1.5	3.5	5.3	1.5	5.8	ns
t <sub>PHL</sub>			1.5	3.9	5.6	1.5	6.2	

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



## 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

**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
74AC11239D	OBSOLETE	SOIC	D	16		TBD	Call TI	Call TI
74AC11239N	OBSOLETE	PDIP	N	16		TBD	Call TI	Call TI

<sup>(1)</sup> The marketing status values are defined as follows:

**ACTIVE:** Product device recommended for new designs.

**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.

**OBSOLETE:** TI has discontinued the production of the device.

<sup>(2)</sup> Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**TBD:** The Pb-Free/Green conversion plan has not been defined.

**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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Mailing Address: Texas Instruments  
Post Office Box 655303 Dallas, Texas 75265