

TYPES SN54AS250, SN74AS250 1-OF-16 DATA GENERATORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

DECEMBER 1983

- 4-Line to 1-Line Multiplexer that can Select 1 of 16 Data Inputs

- Applications:
Boolean Function Generator
Parallel-to-Serial Converter
Data Source Selector

- Buffered 3-State Bus Driver Inputs Permit Multiplexing from N Lines to One Line
- Dependable Texas Instruments Quality and Reliability

description

The 'AS250 provides full binary decoding to select one of sixteen data sources with an inverting \bar{W} output. The selected sources are buffered with symmetrical propagation delay times. This reduces the possibility of transients occurring at the output.

A buffered enable output (\bar{G}) may be used for n-line-to-one-line cascading. Taking the \bar{G} high will place the output in a high-impedance state. In the high-impedance state, the output neither loads nor drives the bus lines significantly.

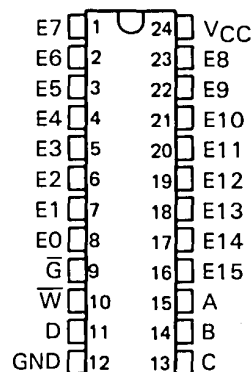
The enable (\bar{G}) does not affect the internal operations of the data selector/multiplexer. New data can be set up while the outputs are disabled.

The SN54AS250 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74AS250 is characterized for operation from 0°C to 70°C .

SN54AS250 . . . J DUAL-IN-LINE PACKAGE

SN74AS250 . . . N DUAL-IN-LINE PACKAGE

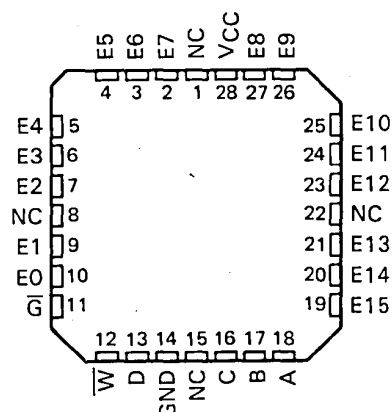
(TOP VIEW)



SN54AS250 . . . FH CHIP CARRIER PACKAGE

SN74AS250 . . . FN CHIP CARRIER PACKAGE

(TOP VIEW)



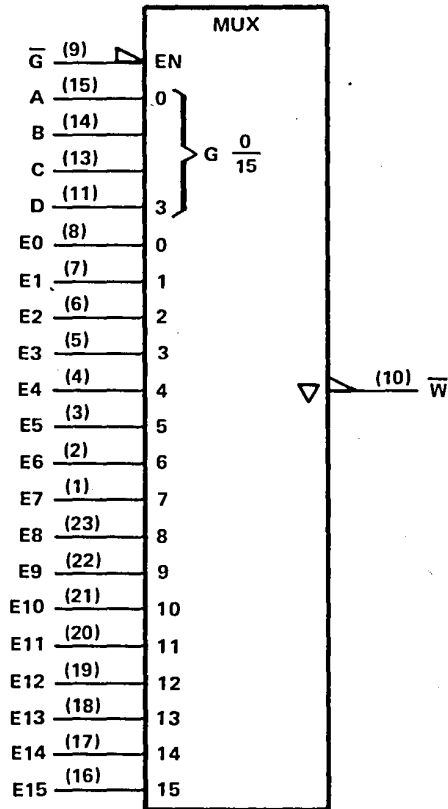
NC - No internal connection

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ALS AND AS CIRCUITS

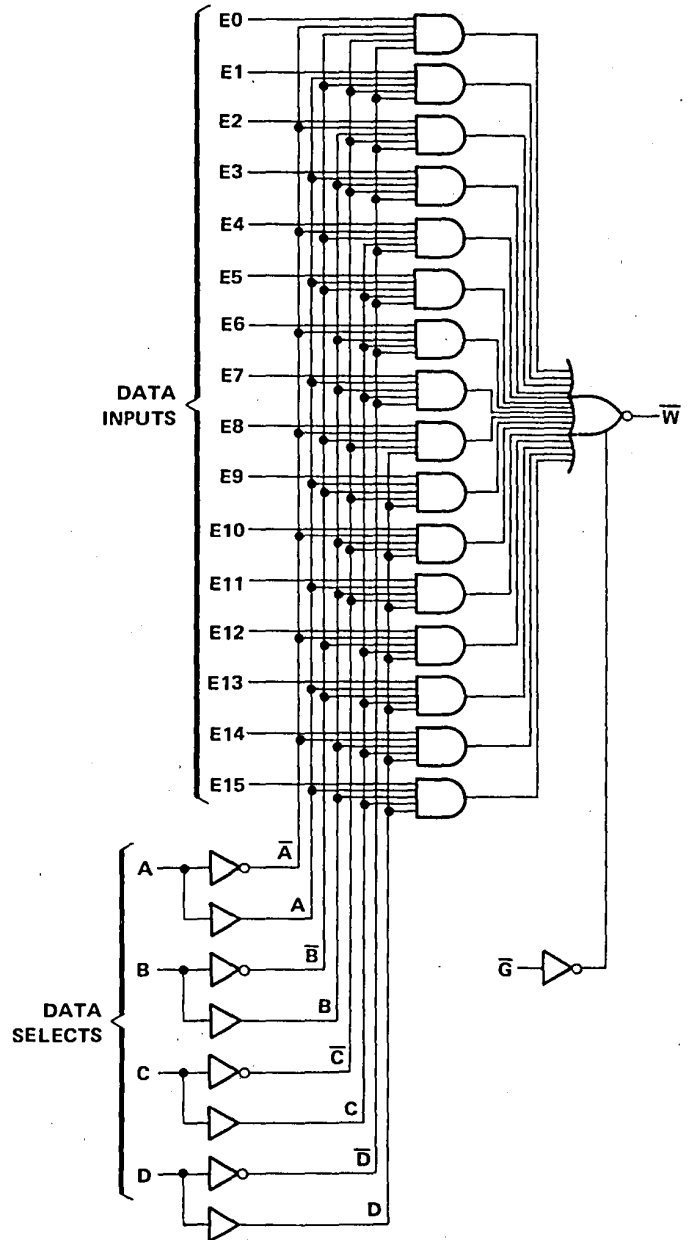
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logic symbol



Pin numbers shown are for J or N packages.

logic diagram (positive logic)



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FUNCTION TABLE

INPUT						OUTPUT
\bar{G}	A	B	C	D	Ei	\bar{W}
L	L	L	L	L	E0	E0
L	H	L	L	L	E1	E1
L	L	H	L	L	E2	E2
L	H	H	L	L	E3	E3
L	L	L	H	L	E4	E4
L	H	L	H	L	E5	E5
L	L	H	H	L	E6	E6
L	H	H	H	L	E7	E7
L	L	L	L	H	E8	E8
L	H	L	L	H	E9	E9
L	L	H	L	H	E10	E10
L	H	H	L	H	E11	E11
L	L	L	H	H	E12	E12
L	H	L	H	H	E13	E13
L	L	H	H	H	E14	E14
L	H	H	H	H	E15	E15
H	X	X	X	X	X	Z

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC}	7 V
Input voltage	7 V
Operating free-air temperature range: SN54AS250	-55°C to 125°C
SN74AS250	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN54AS250			SN74AS250			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{OH}	High-level output curr			-12			-15	mA
I_{OL}	Low-level output curr			32			48	mA
T_A	Operating free-air temperature	-55		125	0		70	°C

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ALS AND AS CIRCUITS

TYPES SN54AS250, SN74AS250 **1-OF-16 DATA GENERATORS/MULTIPLEXERS** **WITH 3-STATE OUTPUTS**

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

PARAMETER	TEST CONDITIONS		SN54AS250		SN74AS250		UNIT
			MIN	TYP†	MAX	MIN	
V_{IK}	$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$		-1.2		-1.2		V
V_{OH}	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$, $I_{OH} = -2 \text{ mA}$		$V_{CC} - 2$		$V_{CC} - 2$		V
	$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -12 \text{ mA}$		2.4	3.2			
	$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -15 \text{ mA}$				2.4	3.3	
V_{OL}	$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 32 \text{ mA}$		0.25	0.5			V
	$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 48 \text{ mA}$				0.35	0.5	
I_{OZH}	$V_{CC} = 5.5 \text{ V}$, $V_O = 2.7 \text{ V}$		50		50		μA
I_{OZL}	$V_{CC} = 5.5 \text{ V}$, $V_O = 0.4 \text{ V}$		-50		-50		μA
I_I	$V_{CC} = 5.5 \text{ V}$, $V_I = 7 \text{ V}$						mA
I_{IH}	$V_{CC} = 5.5 \text{ V}$, $V_I = 2.7 \text{ V}$						μA
I_{IL}	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.4 \text{ V}$						mA
I_O^\ddagger	$V_{CC} = 5.5 \text{ V}$, $V_O = 2.25 \text{ V}$		-30	-112	-30	-112	mA
I_{CC}	$V_{CC} = 5.5 \text{ V}$	Outputs high					mA
		Outputs low					
		Outputs disabled					

†All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$.

‡The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω, T _A = MIN to MAX						UNIT
			SN54AS250			SN74AS250			
			MIN	TYP†	MAX	MIN	TYP†	MAX	
t _{PLH}	DATA	\overline{W}	4.3			4.3			ns
t _{PHL}			4.7			4.7			
t _{PLH}	SELECT	\overline{W}	4.6			4.6			ns
t _{PHL}			7.7			7.7			
t _{PZH}	\overline{G}	\overline{W}	4			4			ns
t _{PZL}			4.9			4.9			
t _{PHZ}	\overline{G}	\overline{W}	3.1			3.1			ns
t _{PLZ}			3.9			3.9			

†All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$.

NOTE 1: For load circuit and voltage waveforms, see page 1-12.