

TYPES SN54125, SN54126, SN54LS125A, SN54LS126A, SN74125, SN74126, SN74LS125A, SN74LS126A QUADRUPLE BUS BUFFERS WITH 3-STATE OUTPUTS

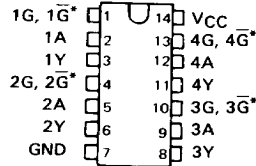
REVISED DECEMBER 1983

- Quad Bus Buffers
- 3-State Outputs
- Separate Control for Each Channel

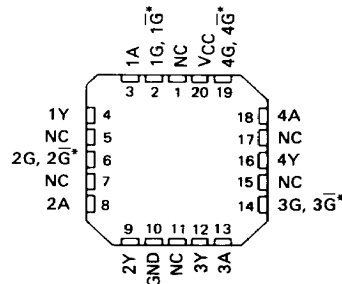
SN54125, SN54126, SN54LS125A,
SN54LS126A ... J OR W PACKAGE
SN74125, SN74126 ... J OR N PACKAGE
SN74LS125A, SN74LS126A ... D, J OR N PACKAGE
(TOP VIEW)

description

These bus buffers feature three-state outputs that, when enabled, have the low impedance characteristics of a TTL output with additional drive capability at high logic levels to permit driving heavily loaded bus lines without external pull-up resistors, when disabled, both output transistors are turned off presenting a high-impedance state to the bus so the output will act neither as a significant load nor as a driver. The '125 and 'LS125A outputs are disabled when $\overline{G}$ is high. The '126 and 'LS126A outputs are disabled when G is low.

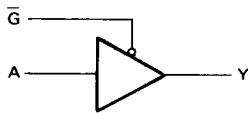


SN54LS125A, SN54LS126A ... FK PACKAGE
SN74LS125A, SN74LS126A ... FN PACKAGE
(TOP VIEW)

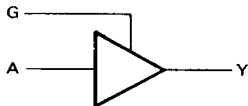


logic diagram (each gate)

'125, 'LS125A



'126, LS126A



positive logic $Y = A$

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage: '125, '126	5.5 V
'LS125A, 'LS126A	7 V
Operating free-air temperature range: SN54'	-55° C to 125° C
SN74'	0° C to 70° C
Storage temperature range	-65° C to 150° C

NOTE 1: Voltage values are with respect to network ground terminal.

PRODUCTION DATA
This document contains information 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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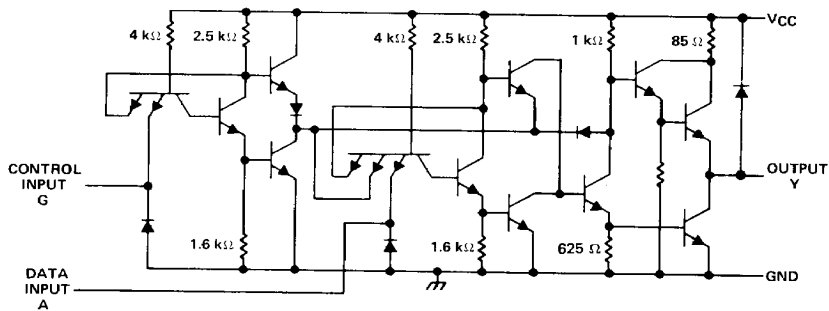
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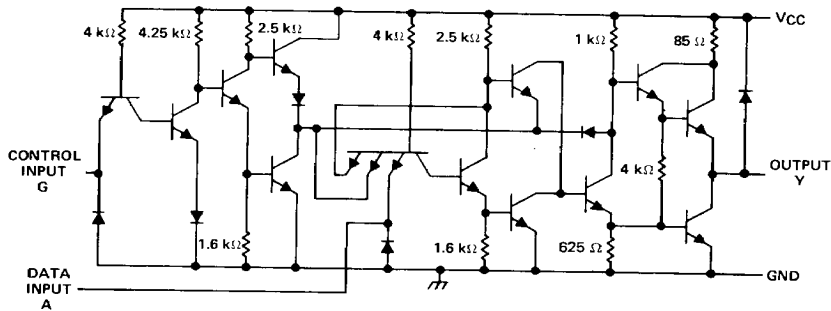
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TYPES SN54125, SN54126, SN74125, SN74126
QUADRUPLE BUS BUFFERS WITH 3-STATE OUTPUTS

schematics (each gate)



'125 CIRCUITS



'126 CIRCUITS

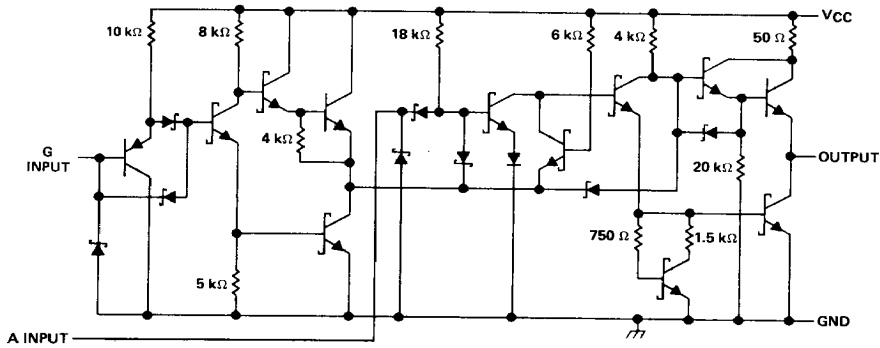
Resistor values shown are nominal.

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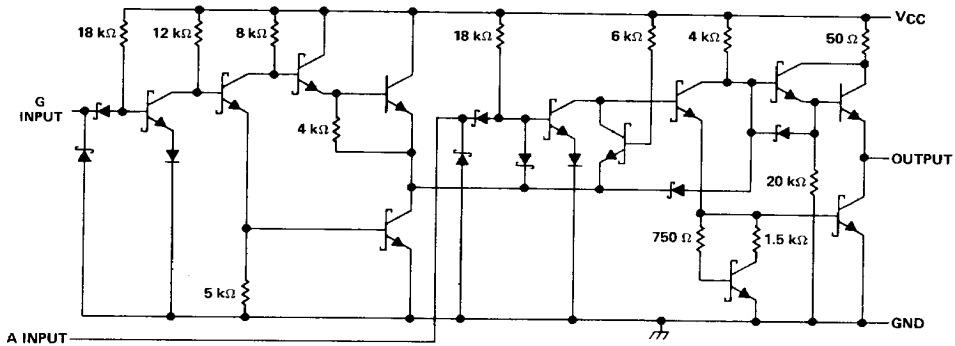
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TYPES SN54LS125A, SN54LS126A, SN74LS125A, SN74LS126A QUADRUPLE BUS BUFFERS WITH 3-STATE OUTPUTS

schematics (each gate)



'LS125A CIRCUITS



'LS126A CIRCUITS

Resistor values shown are nominal.

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TYPES SN54125, SN54126, SN74125, SN74126 QUADRUPLE BUS BUFFERS WITH 3-STATE OUTPUTS

recommended operating conditions

	SN54125, SN54126			SN74125, SN74126			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
V _{CC} Supply voltage	4.5	5	5.5	4.75	5	5.25	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 current	-2			-5.2			mA
I _{OL} Low-level output current	16			16			mA
T _A Operating free-air temperature	-55			0			°C

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

PARAMETER	TEST CONDITIONS †			SN54125, SN54126			SN74125, SN74126			UNIT	
				MIN	TYP‡	MAX	MIN	TYP‡	MAX		
V _{IK}	V _{CC} = MIN, I _I = - 12 mA				- 1.5			- 1.5			V
V _{OH}	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V	I _{OH} = - 2 V			2.4	3.3				V	
		I _{OH} = - 5.2 V			2.4 3.1						
V _{OL}	V _{CC} = MIN, I _{OL} = 16 mA	V _{IH} = 2 V, V _{IL} = 0.8 V,				0.4			0.4	V	
I _{OZ}	V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0.8 V	V _O = 2.4 V			40			40			μA
		V _O = 0.4 V			- 40			- 40			
I _I	V _{CC} = MAX, V _I = 5.5 V				1			1			mA
I _{IH}	V _{CC} = MAX, V _I = 2.4 V				40			40			μA
I _{IL}	V _{CC} = MAX, V _I = 0.4 V				- 1.6			- 1.6			mA
I _{OS} §	V _{CC} = MAX				- 30	- 70	- 28	- 70	mA		
I _{CC}	V _{CC} = MAX, (see Note 2)	'125	32	54		32	54	mA			
		'126	36	62		36	62				

† For condition shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ Not more than one output should be shorted at 2 time.

NOTE 2: Data inputs = 0 V; output control = 4.5 V for '125 and 0 V for '126.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 3)

PARAMETER	TEST CONDITIONS	SN54/74125			SN54/74126			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
t _{PLH}	R _L = 400 Ω, C _L = 50 pF	8	13		8	13		ns
t _{PHL}		12	18		12	18		ns
t _{PZH}		11	17		11	18		ns
t _{PZL}		16	25		16	25		ns
t _{PHZ}	R _L = 400 Ω, C _L = 5 pF	5	8		10	16		ns
t _{PLZ}		7	12		12	18		ns

NOTE 3: See General Information Section for load circuits and voltage waveforms.

TYPES SN54LS125A, SN54LS126A, SN74LS125A, SN74LS126A QUADRUPLE BUS BUFFERS WITH 3-STATE OUTPUTS

recommended operating conditions

	SN54LS125A SN54LS126A			SN74LS125A SN74LS126A			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
V _{CC} Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH} High-level input voltage	2			2			V
V _{IL} Low-level input voltage			0.7			0.8	V
I _{OH} High-level output current			-1			-2.6	mA
I _{OL} Low-level output current			12			24	mA
T _A Operating free-air temperature	-55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS†		SN54LS125A SN54LS126A			SN74LS125A SN74LS126A			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V _{IK}	V _{CC} = MIN, I _I = -18 mA				-1.5			-1.5	V
V _{OH}	V _{CC} = MIN, V _{IH} = 2 V	V _{IL} = 0.7 V, I _{OH} = -1 mA V _{IL} = 0.8 V, I _{OH} = -2.6 mA	2.4			2.4			V
V _{OL}	V _{CC} = MIN, V _{IH} = 2 V	V _{IL} = 0.7 V, I _{OL} = 12 mA	0.25	0.4					V
		V _{IL} = 0.8 V, I _{OL} = 12 mA				0.25	0.4		
		V _{IL} = 0.8 V, I _{OL} = 24 mA				0.35	0.5		
I _{OZ}	V _{CC} = MAX, V _{IH} = 2 V	V _{IL} = 0.7 V	V _O = 2.4 V		20				μA
			V _O = 0.4 V		-20				
		V _{IL} = 0.8 V	V _O = 2.4 V			20			
			V _O = 0.4 V			-20			
I _I	V _{CC} = MAX, V _I = 7 V			0.1			0.1		mA
I _{IH}	V _{CC} = MAX, V _I = 2.7 V			20			20		μA
I _{IL}	V _{CC} = MAX, V _I = 0.4 V	'LS125A-G inputs		-0.2			-0.2		mA
		'LS125A-A inputs, 'LS126A-All inputs		-0.4			-0.4		mA
I _{OS} §	V _{CC} = MAX		-40	-225	-40	-225	-225		mA
I _{CC}	V _{CC} = MAX, (see Note 2)	'LS125A	11	20		11	20		mA
		'LS126A	12	22		12	22		

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ Not more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.

NOTE 2: Data inputs = 0 V; Output controls = 4.5 V for 'LS125A and 0 V for 'LS126A.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 3)

PARAMETER	TEST CONDITIONS		SN54/74LS125A			SN54/74LS126A			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
t _{PLH}	R _L = 667 Ω, C _L = 45 pF		9	15		9	15		ns
t _{PHL}			7	18		8	18		ns
t _{PZH}			12	20		16	25		ns
t _{PZL}			15	25		21	35		ns
t _{PHZ}	R _L = 667 Ω, C _L = 5 pF			20			25		ns
t _{PLZ}				20			25		ns

NOTE 3: See General Information Section for load circuits and voltage waveforms.

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