

SN54ALS758, SN54AS758, SN54AS759 SN74ALS758, SN74AS758, SN74AS759 QUADRUPLE BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

D2910, DECEMBER 1983—REVISED MAY 1986

- 2-Way Asynchronous Communication Between Data Buses
- P-N-P Inputs Reduce Loading
- Open-Collector Versions of 'ALS242A, 'ALS243A and 'AS242, 'AS243
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

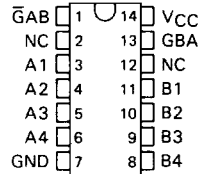
description

These four-data-line transceivers are designed for asynchronous two-way communications between data buses.

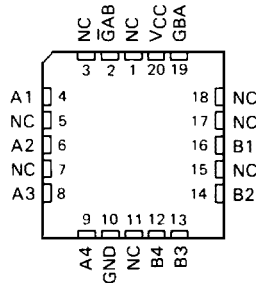
The -1 versions of the SN74ALS' parts are identical to their standard versions except that the recommended maximum I_{OL} is increased to 48 milliamperes. There are no -1 versions of the SN54ALS' parts.

The SN54' family is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74' family is characterized for operation from 0°C to 70°C .

SN54' . . . J PACKAGE
SN74' . . . D OR N PACKAGE
(TOP VIEW)



SN54' . . . FK PACKAGE
(TOP VIEW)



NC—No internal connection

FUNCTION TABLE

INPUTS		'ALS758 'AS758	'AS759
$\bar{G}AB$	GBA		
L	L	\bar{A} to B	A to B
H	H	\bar{B} to A	B to A
H	L	Isolation	Isolation
L	H	Latch A and B ($A = \bar{B}$)	Latch A and B ($A = B$)

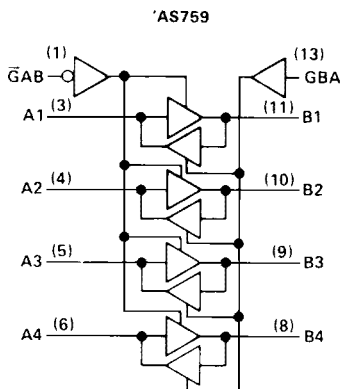
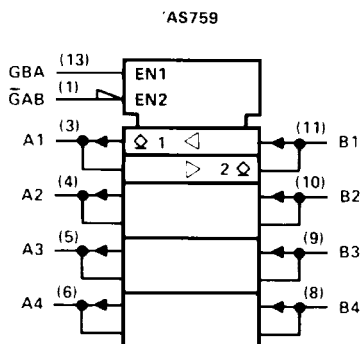
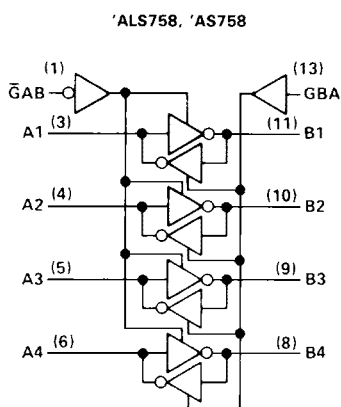
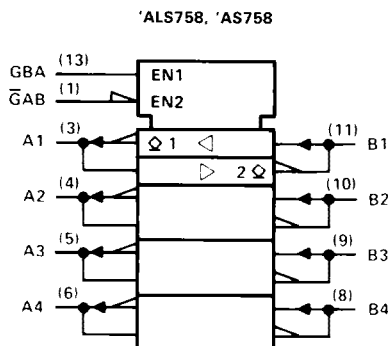
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ALS and AS Circuits

**SN54ALS758, SN54AS758, SN54AS759
SN74ALS758, SN74AS758, SN74AS759
QUADRUPLE BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS**

logic symbols †

logic diagrams (positive logic)



†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12. Pin numbers shown are for D, J, and N packages.

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

Supply voltage, V_{CC}	7 V
Input voltage: All inputs and I/O ports	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

SN54ALS758, SN74ALS758 QUADRUPLE BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

recommended operating conditions

		SN54ALS758			SN74ALS758			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				0.7			V
V _{OH}	High-level output voltage				5.5			V
I _{OL}	Low-level output current				12			mA
					24			
T _A	Operating free-air temperature				48 [†]			°C
		-55			125			

[†]The extended limit applies only if V_{CC} is maintained between 4.75 V and 5.25 V.
The 48 mA limit applies for the SN74ALS758-1.

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

PARAMETER		TEST CONDITIONS	SN54ALS758		SN74ALS758		UNIT
			MIN	TYP [‡] MAX	MIN	TYP [‡] MAX	
V _{IK}		V _{CC} = 4.5 V, I _I = -18 mA	-1.2		-1.2		V
I _{OH}		V _{CC} = 4.5 V, V _{OH} = 5.5 V	0.1		0.1		mA
V _{OL}		V _{CC} = 4.5 V, I _{OL} = 12 mA	0.25	0.4	0.25	0.4	V
		V _{CC} = 4.5 V, I _{OL} = 24 mA [§]			0.35		
I _I	Control inputs	V _{CC} = 5.5 V, V _I = 7 V	0.1		0.1		mA
	A or B ports	V _{CC} = 5.5 V, V _I = 5.5 V	0.1		0.1		
I _{IH}	Control inputs	V _{CC} = 5.5 V, V _I = 2.7 V	20		20		μA
	A or B ports [¶]		20		20		
I _{IL}	Control inputs	V _{CC} = 5.5 V, V _I = 0.4 V	-0.1		-0.1		mA
	A or B ports [¶]		-0.1		-0.1		
I _{CC}	V _{CC} = 5.5 V	Outputs high	6	10	6	10	mA
		Outputs low	10	16	10	16	

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

[§]I_{OL} = 48 mA for -1 versions.

[¶]For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 5 V, C _L = 50 pF, R _L = 680 Ω, T _A = 25°C		V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R _L = 680 Ω, T _A = MIN to MAX		UNIT	
			ALS758	SN54ALS758	SN74ALS758			
			TYP	MIN	MAX	MIN		MAX
t _{PLH}	A or B	B or A	20	10	33	10	28	ns
t _{PHL}			5	2	15	2	12	
t _{PLH}	GBA	A	18	10	33	10	28	ns
t _{PHL}			13	6	25	6	21	
t _{PLH}	$\overline{\text{GAB}}$	B	18	10	33	10	28	ns
t _{PHL}			13	6	25	6	21	

NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

PRODUCTION DATA documents contain 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.


**TEXAS
INSTRUMENTS**

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SN54AS758, SN74AS758 QUADRUPLE BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

recommended operating conditions

		SN54AS758			SN74AS758			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			V
V _{OH}	High-level output voltage				5.5			V
I _{OL}	Low-level output current				64			mA
T _A	Operating free-air temperature	-55			125			°C

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

PARAMETER	TEST CONDITIONS	SN54AS758			SN74AS758			UNIT
		MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	
V _{IK}	V _{CC} = 4.5 V, I _I = -18 mA	-1.2			-1.2			V
I _{OH}	V _{CC} = 4.5 V, V _{OH} = 5.5 V	0.1			0.1			mA
V _{OL}	V _{CC} = 4.5 V, I _{OL} = 48 mA	0.55						V
	V _{CC} = 4.5 V, I _{OL} = 64 mA				0.55			
I _I	Control inputs	V _{CC} = 5.5 V, V _I = 7 V			0.1			mA
	A or B ports	V _{CC} = 5.5 V, V _I = 5.5 V			0.1			
I _{IH}	Control inputs	V _{CC} = 5.5 V, V _I = 2.7 V			20			μA
	A or B ports				50			
I _{IL}	Control inputs	V _{CC} = 5.5 V, V _I = 0.4 V			-0.5			mA
	A or B ports [‡]				-0.5			
I _{CC}	V _{CC} = 5.5 V	Outputs high	17	27	17	27	mA	
		Outputs low	38	60	38	60		

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

[‡]For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R _L = 500 Ω, T _A = MIN to MAX				UNIT
			SN54AS758		SN74AS758		
			MIN	MAX	MIN	MAX	
t _{PLH}	A or B	B or A	3	20.5	3	19.5	ns
t _{PHL}			1	7	1	6	
t _{PLH}	GBA	A	3	22	3	19.5	ns
t _{PHL}			1	8.5	1	7.5	
t _{PLH}	GAB	B	3	22	3	21	ns
t _{PHL}			1	8.5	1	8	

NOTE 1. Load circuit and voltage waveforms are shown in Section 1.

SN54AS759, SN74AS759 QUADRUPLE BUS TRANSCEIVERS WITH OPEN-COLLECTOR OUTPUTS

recommended operating conditions

		SN54AS759			SN74AS759			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			V		
V _{OH}	High-level output voltage				5.5			V		
I _{OL}	Low-level output current				48			64	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	SN54AS759			SN74AS759			UNIT
		MIN	TYP [†]	MAX	MIN	TYP [†]	MAX	
V _{IK}	V _{CC} = 4.5 V, I _I = -18 mA	-1.2			-1.2			V
I _{OH}	V _{CC} = 4.5 V, V _{OH} = 5.5 V	0.1			0.1			mA
V _{OL}	V _{CC} = 4.5 V, I _{OL} = 48 mA	0.55						V
	V _{CC} = 4.5 V, I _{OL} = 64 mA				0.55			
I _I	Control inputs	V _{CC} = 5.5 V, V _I = 7 V			0.1			mA
	A or B ports	V _{CC} = 5.5 V, V _I = 5.5 V			0.1			
I _{IH}	Control inputs	V _{CC} = 5.5 V, V _I = 2.7 V			20			μA
	A or B ports				50			
I _{IL}	Control inputs	V _{CC} = 5.5 V, V _I = 0.4 V			-0.5			mA
	A or B ports [‡]				-1			
I _{CC}	V _{CC} = 5.5 V	Outputs high		27	43	27	43	mA
		Outputs low		47	74	47	74	

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

[‡]For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R _L = 500 Ω, T _A = MIN to MAX				UNIT
			SN54AS759		SN74AS759		
			MIN	MAX	MIN	MAX	
t _{PLH}	A or B	B or A	3	21	3	20	ns
t _{PHL}			1	7	1	6	
t _{PLH}	GBA	A	3	21	3	20	ns
t _{PHL}			1	8	1	7	
t _{PLH}	GAB	B	3	22.5	3	21	ns
t _{PHL}			1	8.5	1	7.5	

NOTE 1. Load circuit and voltage waveforms are shown in Section 1.

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ALS and AS Circuits

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ALS and AS Circuits