

TYPES SN54ALS1245, SN74ALS1245 OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

D2661, DECEMBER 1982—REVISED DECEMBER 1983

- 'Bidirectional Bus Transceivers in High-Density 20-Pin Packages
- Lower-Power Version of 'ALS245
- 'ALS1245 is Identical to 'ALS1645
- Package Options Include Both Plastic and Ceramic Chip Carriers in Addition to Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

description

This octal bus transceiver is designed for asynchronous two-way communication between data buses. The device transmits data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction control (DIR) input. The enable input (G) can be used to disable the device so the buses are effectively isolated.

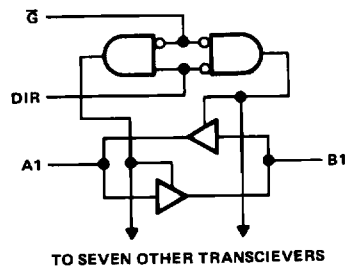
The -1 version of the SN74ALS1245 is identical to the standard versions except that the recommended maximum I_{OL} is increased to 24 milliamperes. There is no -1 version of the SN54ALS1245.

The SN54ALS1245 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ALS1245 is characterized for operation from 0°C to 70°C .

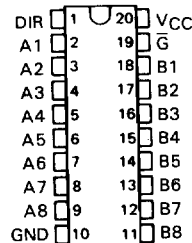
FUNCTION TABLE

CONTROL INPUTS		OPERATION
G	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

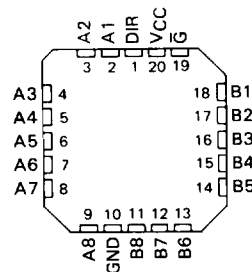
logic diagram (positive logic)



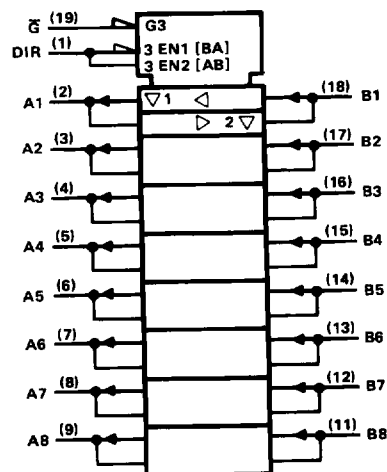
SN54ALS1245 . . . J PACKAGE
SN74ALS1245 . . . N PACKAGE
(TOP VIEW)



SN54ALS1245 . . . FH PACKAGE
SN74ALS1245 . . . FN PACKAGE



logic symbol



Pin numbers shown are for J and N packages.

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TYPES SN54ALS1245, SN74ALS1245

OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

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

Supply voltage, V_{CC}	7 V
Input voltage: All inputs	7 V
I/O ports	5.5 V
Operating free-air temperature range: SN54ALS1245	-55 °C to 125 °C
SN74ALS1245	0 °C to 70 °C
Storage temperature range	-65 °C to 150 °C

recommended operating conditions

	SN54ALS1245			SN74ALS1245			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 current			-12			-15	mA
I_{OL} Low-level output current			8			16	mA
T_A Operating free-air temperature						24 [†]	°C
						70	°C

[†]The extended limit applies only if V_{CC} is maintained between 4.75 V and 5.25 V.
The 24-mA limit applies for the SN74ALS1245-1 only.

ALS AND AS CIRCUITS

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

PARAMETER	TEST CONDITIONS	SN54ALS1245		SN74ALS1245		UNIT			
		MIN	TYP [‡]	MAX	MIN		TYP [‡]	MAX	
V_{IK}	$V_{CC} = 4.5$ V, $I_I = -18$ mA			-1.5		-1.5	V		
V_{OH}	$V_{CC} = 4.5$ V to 5.5 V, $I_{OH} = -0.4$ mA	$V_{CC}-2$			$V_{CC}-2$		V		
	$V_{CC} = 4.5$ V, $I_{OH} = -3$ mA	2.4	3.2		2.4	3.2	V		
	$V_{CC} = 4.5$ V, $I_{OH} = -12$ mA	2					V		
	$V_{CC} = 4.5$ V, $I_{OH} = -15$ mA				2		V		
V_{OL}	$V_{CC} = 4.5$ V, $I_{OL} = 8$ mA		0.25	0.4		0.25	0.4	V	
	$V_{CC} = 4.5$ V, $I_{OL} = 16$ mA						V		
	($I_{OL} = 24$ mA for -1 version)					0.35	0.5	V	
I_I	Control inputs								
	A, B ports [§]	$V_{CC} = 5.5$ V, $V_I = 7$ V		0.1		0.1	mA		
I_{IH}	Control inputs								
	A, B ports [§]	$V_{CC} = 5.5$ V, $V_I = 5.5$ V		0.1		0.1	mA		
	A, B ports [§]	$V_{CC} = 5.5$ V, $V_I = 2.7$ V		20		20	μA		
I_{IL}	Control inputs								
	A, B ports [§]	$V_{CC} = 5.5$ V, $V_I = 0.4$ V		-0.1		-0.1	mA		
I_{O1}	$V_{CC} = 5.5$ V, $V_O = 2.25$ V								
I_{CC}	$V_{CC} = 5.5$ V	Output high		20	33		20	32	mA
		Output low		23	39		23	37	mA
		Output disabled		25	41		25	39	mA

[‡]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.

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

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OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V,}$ $C_L = 50 \text{ pF,}$ $R_1 = 500 \Omega,$ $R_2 = 500 \Omega,$ $T_A = \text{MIN to MAX}$				UNIT
			SN54ALS1245		SN74ALS1245		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	4	15	4	13	ns
t_{PHL}			4	15	4	13	
t_{PZH}	\bar{G}	A or B	10	27	10	25	ns
t_{PZL}			13	32	13	29	
t_{PHZ}	\bar{G}	A or B	4	20	4	18	ns
t_{PLZ}			5	23	5	21	

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

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ALS AND AS CIRCUITS