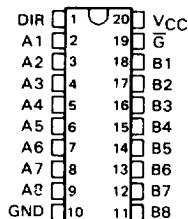


SN74ALS1640A, SN74ALS1645A OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

D2661, DECEMBER 1982 - REVISED MAY 1986

- Bidirectional Bus Transceivers in High-Density 20-Pin Packages
- Lower-Power Versions of 'ALS640 Series
- Package Options Include Plastic "Small Outline" Packages and Standard Plastic 300-mil DIPs
- Dependable Texas Instruments Quality and Reliability

SN74ALS' ... DW OR N PACKAGE (TOP VIEW)



description

These octal bus transceivers are designed for asynchronous two-way communication between data buses. The devices transmit 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 ($\bar{G}$) can be used to disable the device so the buses are effectively isolated. The 'ALS1640A features inverting logic, while the 'ALS1645A features noninverting logic.

The SN74ALS' family is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

CONTROL INPUTS		OPERATION	
$\bar{G}$	DIR	'ALS1640A	'ALS1645A
L	L	B data to A bus	B data to A bus
L	H	$\bar{A}$ data to B bus	A data to Bus
H	X	Isolation	Isolation

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.

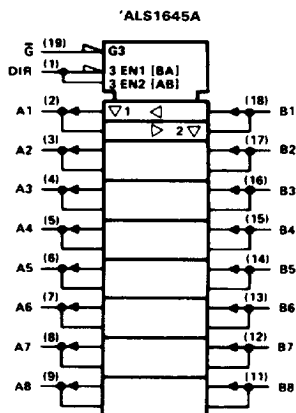
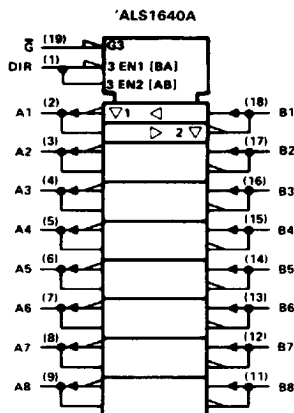


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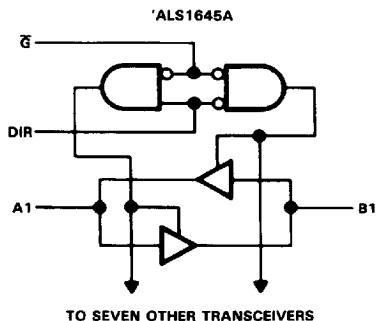
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8961723 0099312 652

logic symbols[†]



[†]These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12



SN74ALS1640A, SN74ALS1645A 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: SN74ALS1640A, SN74ALS1645A	0°C to 70°C
Storage temperature range	-65°C to 150°C

recommended operating conditions

		SN74ALS1640A SN74ALS1645A			UNIT
		MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			V
V_{IL}	Low-level input voltage			0.8	V
I_{OH}	High-level output current			-15	mA
I_{OL}	Low-level output current			16	mA
T_A	Operating free-air temperature	0		70	°C

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

PARAMETER		TEST CONDITIONS		SN74ALS1640A SN74ALS1645A			UNIT
				MIN	TYP [‡]	MAX	
V_{IK}		$V_{CC} = 4.5 \text{ V}$, $I_I = -18 \text{ mA}$				-15	V
V_{OH}		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$, $I_{OH} = -0.4 \text{ mA}$		$V_{CC}-2$			V
		$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -3 \text{ mA}$		2.4	3.2		
		$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -12 \text{ mA}$					
		$V_{CC} = 4.5 \text{ V}$, $I_{OH} = -15 \text{ mA}$		2			
V_{OL}		$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 8 \text{ mA}$			0.25	0.4	V
		$V_{CC} = 4.5 \text{ V}$, $I_{OL} = 16 \text{ mA}$			0.35	0.5	
		$V_{CC} = 4.75 \text{ V}$, $I_{OL} = 24 \text{ mA}$ (-1 versions)			0.35	0.5	
		$V_{CC} = 5.5 \text{ V}$, $V_I = 7 \text{ V}$				0.1	
I_I	Control inputs	$V_{CC} = 5.5 \text{ V}$, $V_I = 5.5 \text{ V}$				0.1	mA
	A or B ports	$V_{CC} = 5.5 \text{ V}$, $V_I = 2.7 \text{ V}$				20	
I_{IH}	Control inputs	$V_{CC} = 5.5 \text{ V}$, $V_I = 2.7 \text{ V}$				20	μA
	A or B ports [§]					-0.1	
I_{IL}	Control inputs	$V_{CC} = 5.5 \text{ V}$, $V_I = 0.4 \text{ V}$				-0.1	mA
	A or B ports [§]					-112	
$I_O^†$		$V_{CC} = 5.5 \text{ V}$, $V_O = 2.25 \text{ V}$		-30		-112	mA
I_{CC}	'ALS1640A	$V_{CC} = 5.5 \text{ V}$			18	32	mA
	'ALS1645A				25	36	

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

[§] 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}



SN74ALS1640A, SN74ALS1645A
OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

ALS1640A 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
			SN74ALS1640A		
			MIN	MAX	
t _{PLH}	A or B	B or A	5	15	ns
t _{PHL}			2	10	
t _{PZH}	$\overline{G}$	A or B	5	20	ns
t _{PZL}			5	22	
t _{PHZ}	$\overline{G}$	A or B	2	10	ns
t _{PLZ}			5	13	

ALS1645A 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
			SN74ALS1645A		
			MIN	MAX	
t _{PLH}	A or B	B or A	2	13	ns
t _{PHL}			2	13	
t _{PZH}	G̅	A or B	8	25	ns
t _{PZL}			8	25	
t _{PHZ}	G̅	A or B	2	12	ns
t _{PLZ}			3	18	

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

