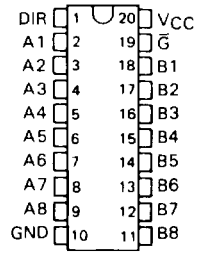
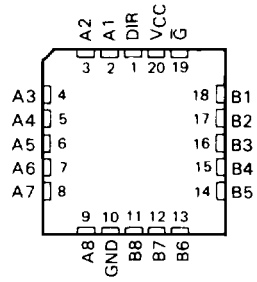
- **Octal Bus Transceivers for Driving MOS Devices**
- **I/O Ports Have 25-Ω Series Resistors, So No External Resistors Are Required**
- **Choice of True or Inverting Logic**
- **Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**
- **Dependable Texas Instruments Quality and Reliability**

SN54AS' . . . J PACKAGE
SN74AS' . . . DW or N PACKAGE
(TOP VIEW)



SN54AS' . . . FK PACKAGE
(TOP VIEW)



description

These octal bus transceivers are designed to drive the capacitive input characteristics of MOS devices and allow asynchronous two-way communication between data buses. The control function implementation allows for maximum flexibility in timing.

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 ($\overline{G}$) can be used to disable the device so the buses are effectively isolated.

The SN54AS' family is characterized for operation over the full military temperature range of −55°C to 125°C. The SN74AS' family is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

CONTROL INPUTS		OPERATION	
$\overline{G}$	DIR	'AS2640	'AS2645
L	L	$\overline{B}$ data to A bus	B data to A bus
L	H	$\overline{A}$ data to B bus	A data to B 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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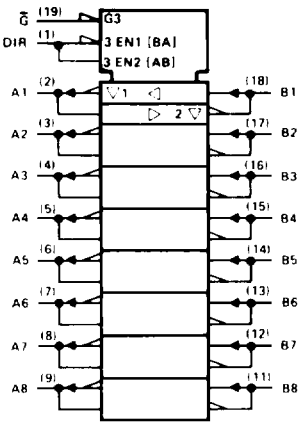
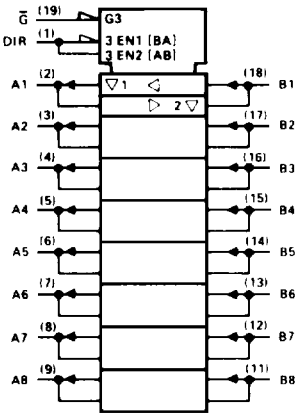
logic symbols†

'AS2640



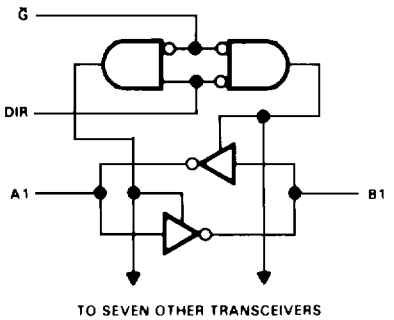
'AS2645



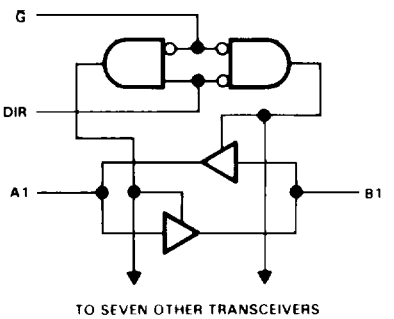
†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

functional block diagrams (positive logic)

'AS2640



'AS2645



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: SN54AS2640, SN54AS2645 . . . . . −55°C to 125°C
SN74AS2640, SN74AS2645 . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

		SN54AS2640 SN54AS2645			SN74AS2640 SN74AS2645			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-lvel input voltage			0.8			0.8	V
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		SN54AS'			SN74AS'			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}		V_{CC} = 4.5 V to 5.5 V,	I_{OH} = −2 mA	V_{CC} −2			V_{CC} −2			V
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 1 mA		0.15	0.4		0.15	0.4	V
		V_{CC} = 4.5 V,	I_{OL} = 12 mA		0.35	0.7		0.35	0.7	
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‡					70			70	
I_{IL}	Control inputs	V_{CC} = 5.5 V,	V_I = 0.4 V			−0.5			−0.5	mA
	A or B ports‡					−0.75			−0.75	
I_O§		V_{CC} = 5.5 V,	V_O = 2.25 V	−50		−150	50		150	mA
I_{OH}		V_{CC} = 4.5 V,	V_O = 2 V	−35			−35			mA
I_{OL}		V_{CC} = 4.5 V,	V_{OL} = 2 V	35			35			mA
I_{CC}	'AS2640	V_{CC} = 5.5 V	Outputs high		37	58		37	58	mA
			Outputs low		78	123		78	123	
			Outputs disabled		51	80		51	80	
	'AS2645		Outputs high		58	95		58	95	
			Outputs low		95	155		95	155	
			Outputs disabled		73	119		73	119	

†All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡For I/O ports, the parametes 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}.

'AS2640 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX				UNIT
			SN54AS2640		SN74AS2640		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1	9.5	1	7.5	ns
t_{PHL}			1	7	1	6.5	
t_{PZH}	$\overline{G}$	A or B	2	11	2	9	ns
t_{PZL}			2	12	2	10	
t_{PHZ}	$\overline{G}$	A or B	1	8	1	7	ns
t_{PLZ}			2	15	2	13	

'AS2645 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX				UNIT
			SN54AS2645		SN74AS2645		
			MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1	12	1	10	ns
t_{PHL}			1	11	1	9.5	
t_{PZH}	$\overline{G}$	A or B	1	13	1	11.5	ns
t_{PZL}			1	13	1	10.5	
t_{PHZ}	$\overline{G}$	A or B	1	9	1	8	ns
t_{PLZ}			1	13	1	12	

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