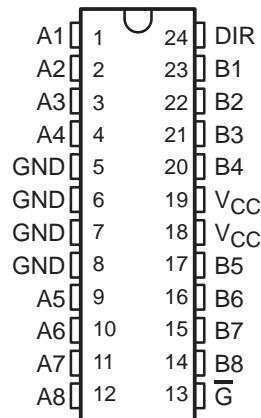


74ACT11643  
OCTAL BUS TRANSCEIVER  
WITH 3-STATE OUTPUTS

SCAS051A – D2957, JULY 1987 – REVISED APRIL 1993

- Bidirectional Bus Transceiver in High-Density 24-Pin Package
- Inputs Are TTL-Voltage Compatible
- Flow-Through Architecture to Optimize PCB Layout
- Center-Pin  $V_{CC}$  and GND Configurations to Minimize High-Speed Switching Noise
- EPIC™ (Enhanced-Performance Implanted CMOS) 1- $\mu$ m Process
- 500-mA Typical Latch-Up Immunity at 125°C
- Package Options Include Plastic Small-Outline Packages and Standard Plastic 300-mil DIPs

DW OR NT PACKAGE  
(TOP VIEW)



**description**

This octal bus transceiver is designed for asynchronous two-way communication between data buses. This 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  $\bar{G}$  can be used to disable the device so the buses are effectively isolated.

The 74ACT11643 is characterized for operation from – 40°C to 85°C.

FUNCTION TABLE

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

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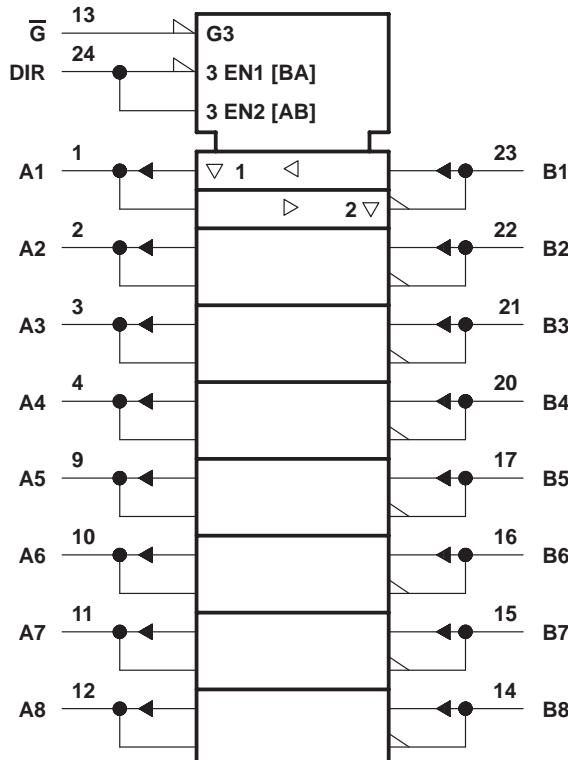


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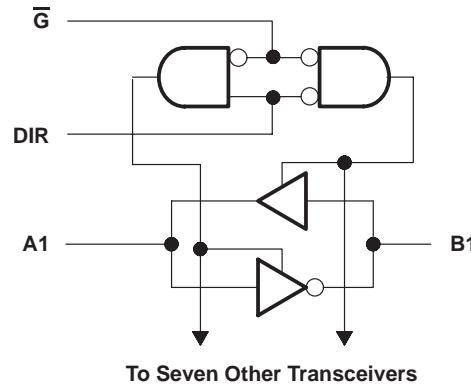
# 74ACT11643 OCTAL BUS TRANSCEIVER WITH 3-STATE OUTPUTS

SCAS051A-D2957, JULY 1987 - REVISED APRIL 1993

## logic symbol†



## logic diagram (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

Supply voltage range, $V_{CC}$ .....	-0.5 V to 7 V
Input voltage range, $V_I$ (see Note 1) .....	-0.5 V to $V_{CC} + 0.5$ V
Output voltage range, $V_O$ (see Note 1) .....	-0.5 V to $V_{CC} + 0.5$ V
Input clamp current, $I_{IK}$ ( $V_I < 0$ or $V_I > V_{CC}$ ) .....	$\pm 20$ mA
Output clamp current, $I_{OK}$ ( $V_O < 0$ or $V_O > V_{CC}$ ) .....	$\pm 50$ mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ ) .....	$\pm 50$ mA
Continuous current through $V_{CC}$ or GND .....	$\pm 200$ mA
Storage temperature range .....	-65°C to 150°C

‡ Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

**recommended operating conditions**

		MIN	NOM	MAX	UNIT
$V_{CC}$	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
$V_I$	Input voltage	0	$V_{CC}$		V
$V_O$	Output voltage	0	$V_{CC}$		V
$I_{OH}$	High-level output current			-24	mA
$I_{OL}$	Low-level output current			24	mA
$\Delta t/\Delta v$	Input transition rise or fall rate	0	10		ns/V
$T_A$	Operating free-air temperature	-40	85		°C

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

PARAMETER	TEST CONDITIONS	$V_{CC}$	$T_A = 25^\circ C$			MIN	MAX	UNIT
			MIN	TYP	MAX			
$V_{OH}$	$I_{OH} = -50 \mu A$	4.5 V	4.4		4.4	V	V	
		5.5 V	5.4		5.4			
	$I_{OH} = -24 mA$	4.5 V	3.94		3.8			
		5.5 V	4.94		4.8			
	$I_{OH} = -75 mA^\dagger$	5.5 V			3.85			
$V_{OL}$	$I_{OL} = 50 \mu A$	4.5 V		0.1	0.1	V	V	
		5.5 V		0.1	0.1			
	$I_{OL} = 24 mA$	4.5 V		0.36	0.44			
		5.5 V		0.36	0.44			
	$I_{OL} = 75 mA^\dagger$	5.5 V			1.65			
$I_{OZ}$	A or B ports <sup>‡</sup>	$V_O = V_{CC}$ or GND	5.5 V		$\pm 0.5$	$\pm 5$	$\mu A$	
$I_I$	$\bar{G}$ or DIR	$V_I = V_{CC}$ or GND	5.5 V		$\pm 0.1$	$\pm 1$	$\mu A$	
$I_{CC}$		$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V		8	80	$\mu A$	
$\Delta I_{CC}^\$$		One input at 3.4 V, Other inputs at GND or $V_{CC}$	5.5 V		0.9	1	mA	
$C_i$	$\bar{G}$ or DIR	$V_I = V_{CC}$ or GND	5 V		4		pF	
$C_o$	A or B ports	$V_O = V_{CC}$ or GND	5 V		12		pF	

<sup>†</sup> Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.

<sup>‡</sup> For I/O ports, the parameter  $I_{OZ}$  includes the input leakage.

<sup>\$</sup> This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V or  $V_{CC}$ .

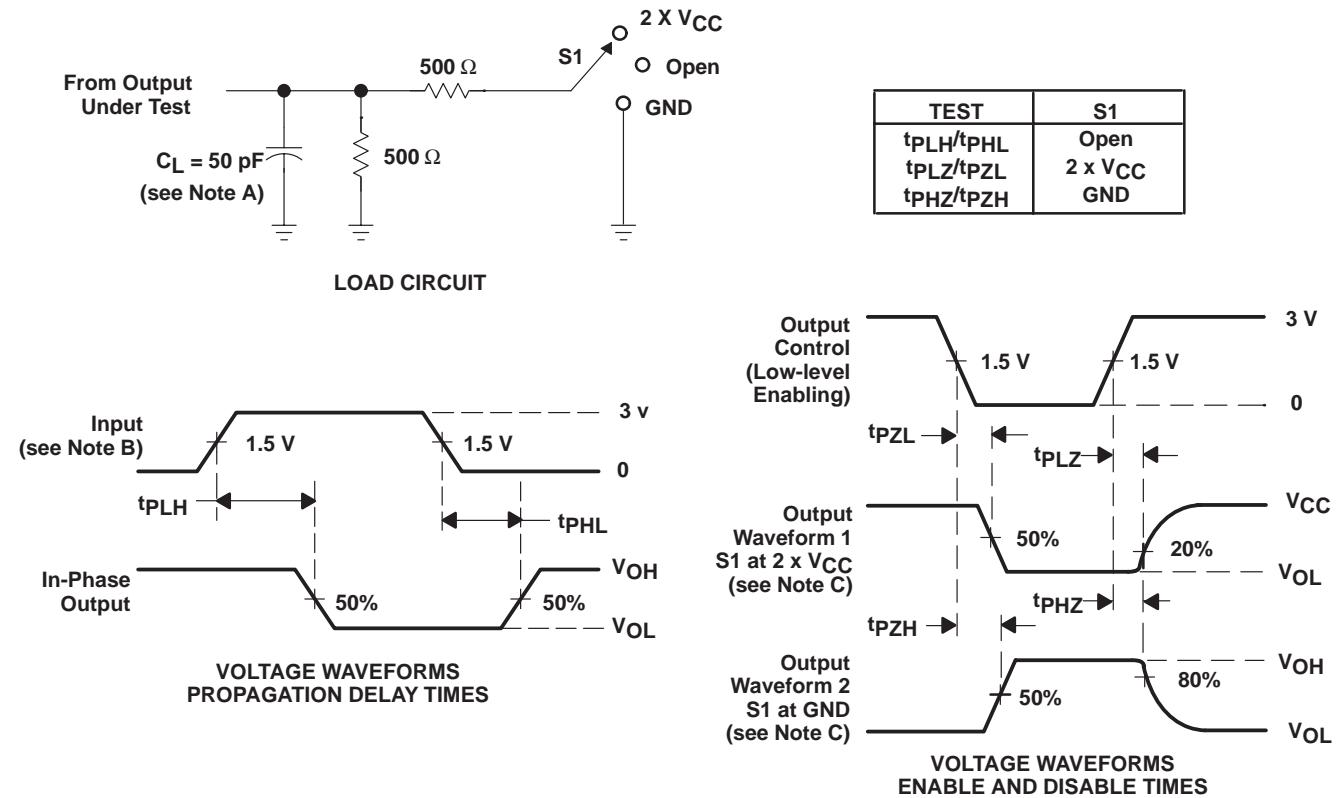
**switching characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$T_A = 25^\circ C$			MIN	MAX	UNIT
			MIN	TYP	MAX			
$t_{PLH}$	A or B	B or A	1.5	5.6	8.3	1.5	9.3	ns
			1.5	5.7	7.7			
$t_{PHL}$	$\bar{G}$	A or B	1.5	8.1	11.5	1.5	12.9	ns
			1.5	7.7	10.1			
$t_{PZH}$	$\bar{G}$	A or B	1.5	9.1	12	1.5	13.1	ns
			1.5	9.3	11.6			
$t_{PZL}$	$\bar{G}$	A or B	1.5	9.3	11.6			
$t_{PHZ}$	$\bar{G}$	A or B	1.5	9.1	12	1.5	13.1	ns
			1.5	9.3	11.6			
$t_{PLZ}$	$\bar{G}$	A or B	1.5	9.3	11.6			

operating characteristics,  $V_{CC} = 5$  V,  $T_A = 25^\circ\text{C}$ 

PARAMETER		TEST CONDITIONS	TYP	UNIT
$C_{pd}$	Power dissipation capacitance per transceiver	Outputs enabled	45	
		Outputs disabled	12	pF

## PARAMETER MEASUREMENT INFORMATION



NOTES: A.  $C_L$  includes probe and jig capacitance.

B. All input pulses are supplied by generators having the following characteristics: PRR  $\leq 10$  MHz,  $Z_O = 50 \Omega$ ,  $t_r \leq 3$  ns,  $t_f \leq 3$  ns.

C. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.

Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.

D. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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