- **Inputs Are TTL-Voltage Compatible**
- ***EPIC***™ **(Enhanced-Performance Implanted CMOS) 1-μm Process**
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description

These octal bus transceivers are designed for asynchronous two-way communication between data buses. The control-function implementation minimizes external timing requirements.

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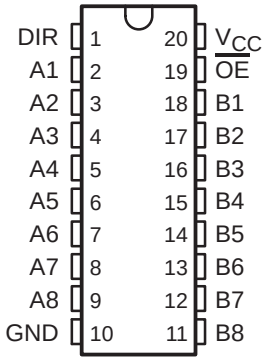
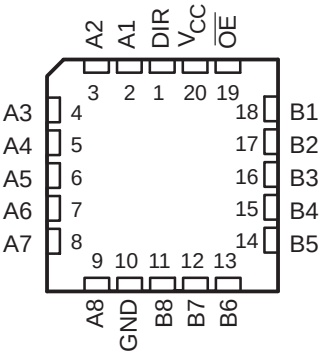
The SN54ACT245 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ACT245 is characterized for operation from –40°C to 85°C.

SN54ACT245 . . . J OR W PACKAGE
SN74ACT245 . . . DB, DW, N, OR PW PACKAGE
(TOP VIEW)



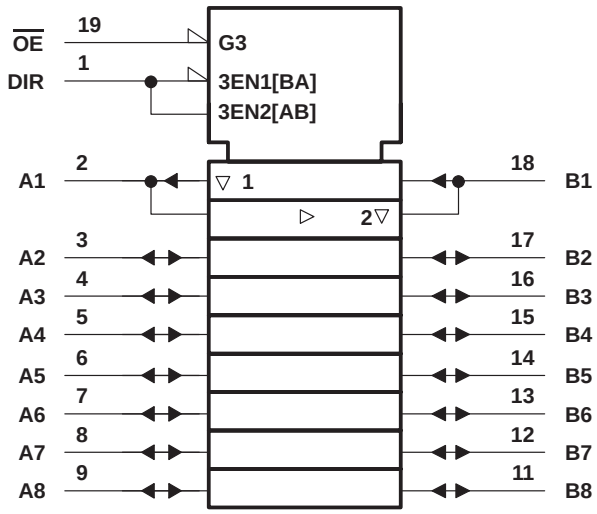
SN54ACT245 . . . FK PACKAGE
(TOP VIEW)



FUNCTION TABLE
(each transceiver)

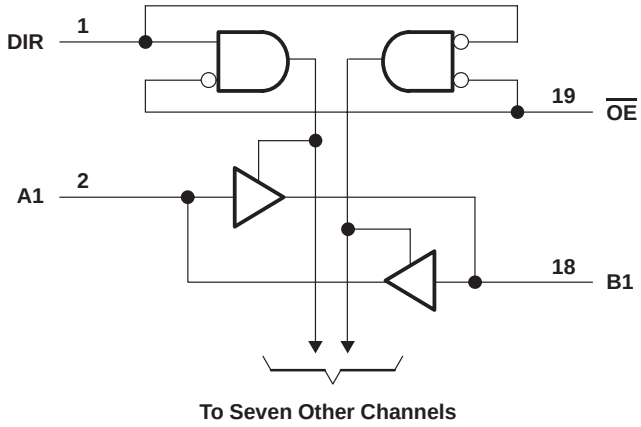
INPUTS		OPERATION
$\overline{OE}$	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

logic symbol†



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

logic diagram (positive logic)



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}) . . . . . ±20 mA
Output clamp current, I_{OK} (V_O < 0 or V_O > V_{CC}) . . . . . ±20 mA
Continuous output current, I_O (V_O = 0 to V_{CC}) . . . . . ±50 mA
Continuous current through V_{CC} or GND . . . . . ±200 mA
Package thermal impedance, θ_{JA} (see Note 2): DB package . . . . . 70°C/W
DW package . . . . . 58°C/W
N package . . . . . 69°C/W
PW package . . . . . 83°C/W
Storage temperature range, T_{stg} . . . . . –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.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. The package thermal impedance is calculated in accordance with JESD 51.

recommended operating conditions (see Note 3)

		SN54ACT245		SN74ACT245		UNIT
		MIN	MAX	MIN	MAX	
V_{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V_{IH}	High-level input voltage	2		2		V
V_{IL}	Low-level input voltage		0.8		0.8	V
V_I	Input voltage	0	V_{CC}	0	V_{CC}	V
V_O	Output voltage	0	V_{CC}	0	V_{CC}	V
I_{OH}	High-level output current		–24		–24	mA
I_{OL}	Low-level output current		24		24	mA
$\Delta t/\Delta v$	Input transition rise or fall rate	0	8	0	8	ns/V
T_A	Operating free-air temperature	–55	125	–40	85	°C

NOTE 3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

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

PARAMETER		TEST CONDITIONS	V_{CC}	T_A = 25°C			SN54ACT245		SN74ACT245		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}		I_{OH} = – 50 μA	4.5 V	4.4	4.49		4.4		4.4		V
			5.5 V	5.4	5.49		5.4		5.4		
		I_{OH} = – 24 mA	4.5 V	3.88			3.7		3.76		
			5.5 V	4.86			4.7		4.76		
		I_{OH} = –50 mA†	5.5 V				3.85				
		I_{OH} = –75 mA†	5.5 V						3.85		
V_{OL}		I_{OL} = 50 μA	4.5 V		0.001	0.1		0.1		0.1	V
			5.5 V		0.001	0.1		0.1		0.1	
		I_{OL} = 24 mA	4.5 V			0.36		0.5		0.44	
			5.5 V			0.36		0.5		0.44	
		I_{OL} = 50 mA†	5.5 V					1.65			
		I_{OL} = 75 mA†	5.5 V							1.65	
I_{OZ}	A or B ports‡	$V_O = V_{CC}$ or GND	5.5 V			±0.5		±10		±5	μA
I_I	OE or DIR	$V_I = V_{CC}$ or GND	5.5 V			±0.1		±1		±1	μA
I_{CC}		$V_I = V_{CC}$ or GND, I_O = 0	5.5 V			4		80		40	μA
ΔI_{CC}§		One input at 3.4 V, Other inputs at GND or V_{CC}	5.5 V		0.6			1.6		1.5	mA
C_i		$V_I = V_{CC}$ or GND	5 V		4.5						pF
C_{io}		$V_O = V_{CC}$ or GND	5 V		15						pF

† Not more than one output should be tested at a time, and the duration of the test should not exceed 2 ms.
‡ For I/O ports, the parameter I_{OZ} includes the input leakage current.
§ 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}.

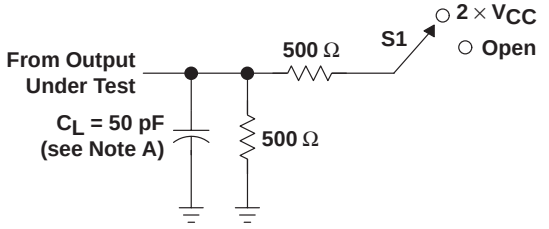
switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			SN54ACT245		SN74ACT245		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1	4	7.5	1	9	1.5	8	ns
t_{PHL}			1	4	8	1	10	1	9	
t_{PZH}	$\overline{OE}$	A or B	1	5	10	1	12	1.5	11	ns
t_{PZL}			1	5.5	10	1	13	1.5	12	
t_{PHZ}	$\overline{OE}$	A or B	1	5.5	10	1	12	1	11	ns
t_{PLZ}			1	5	10	1	12	1.5	11	

operating characteristics, V_{CC} = 5 V, T_A = 25°C

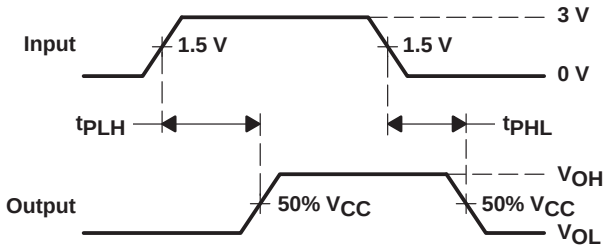
PARAMETER		TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance	C_L = 50 pF, f = 1 MHz	45	pF

PARAMETER MEASUREMENT INFORMATION

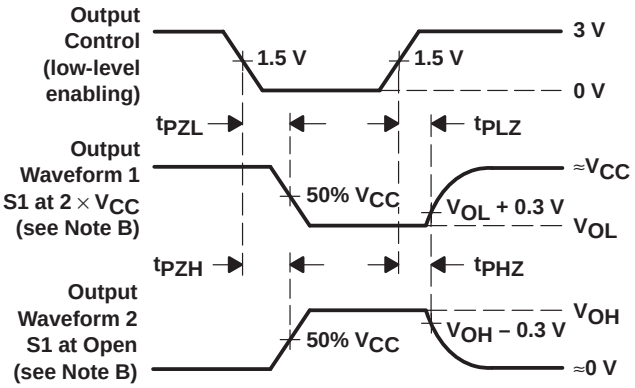


LOAD CIRCUIT

TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	2 × V_{CC}
t_{PHZ}/t_{PZH}	Open



VOLTAGE WAVEFORMS



VOLTAGE WAVEFORMS

NOTES: A. C_L includes probe and jig capacitance.
B. 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.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 1 MHz, Z_O = 50 Ω, t_r ≤ 2.5 ns, t_f ≤ 2.5 ns.
D. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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SN74ACT245, Octal Bus Transceivers With 3-State Outputs

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54ACT245	SN74ACT245
Voltage Nodes (V)	5	5
Vcc range (V)	4.5 to 5.5	4.5 to 5.5
Input Level	TTL	TTL
Output Level	CMOS	CMOS
Output Drive (mA)		-24/24
No. of Outputs	8	8
Logic	True	True
Static Current		0.04
tpd max (ns)		9

FEATURES

Back to Top

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Back to Top

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TECHNICAL DOCUMENTS

Back to Top

To view the following documents, Acrobat Reader 4.0 is required.
To download a document to your hard drive, right-click on the link and choose 'Save'.

DATASHEET

Back to Top

Full datasheet in Acrobat PDF: sn74act245.pdf (75 KB,Rev.D) (Updated: 01/17/2000)

APPLICATION NOTES

Back to Top

View Application Notes for Digital Logic

- CMOS Power Consumption and CPD Calculation (Rev. B) (SCAA035B - Updated: 06/01/1997)
- Designing With Logic (Rev. C) (SDYA009C - Updated: 06/01/1997)
- Evaluation of Nickel/Palladium/Gold-Finished Surface-Mount Integrated Circuits (SZZA026 - Updated: 06/20/2001)
- Implications of Slow or Floating CMOS Inputs (Rev. C) (SCBA004C - Updated: 02/01/1998)
- LVT-to-LVTH Conversion (SCEA010 - Updated: 12/08/1998)
- Logic Solutions For IEEE Std 1284 (SCEA013 - Updated: 06/01/1999)
- Using High Speed CMOS and Advanced CMOS in Systems With Multiple Vcc (SCLA008 - Updated: 04/01/1996)

RELATED DOCUMENTS

Back to Top

View Related Documentation for Digital Logic

- Logic Reference Guide (SCYB004, 1032 KB - Updated: 10/23/2001)
- Logic Selection Guide Second Half 2002 (Rev. R) (SDYU001R, 4274 KB - Updated: 07/19/2002)
- Military Semiconductors Selection Guide 2002 (Rev. B) (SGYC003B, 1648 KB - Updated: 04/22/2002)

SAMPLES

Back to Top

ORDERABLE DEVICE	PACKAGE INDUSTRY (TI)	PINS	TEMP (°C)	STATUS	PRODUCT CONTENT	SAMPLES
SN74ACT245DBR	SSOP (DB)	20	-40 TO 85	ACTIVE	View Product Content	Request Samples
SN74ACT245DW	SOP (DW)	20	-40 TO 85	ACTIVE	View Product Content	Request Samples
SN74ACT245N	PDIP (N)	20	-40 TO 85	ACTIVE	View Product Content	Request Samples
SN74ACT245PWR	TSSOP (PW)	20	-40 TO 85	ACTIVE	View Product Content	Request Samples

PRICING/AVAILABILITY/PKG

Back to Top

DEVICE INFORMATION							TI INVENTORY STATUS AS OF 3:00 PM GMT, 26 Sep 2002			REPORTED DISTRIBUTOR INVENTORY AS OF 3:00 PM GMT, 26 Sep 2002		
ORDERABLE DEVICE	STATUS	PACKAGE TYPE|PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY | $US	STD PACK QTY	IN STOCK	IN PROGRESS QTY|DATE	LEAD TIME	DISTRIBUTOR COMPANY|REGION	IN STOCK	PURCHASE
SN74ACT245DBLE	OBSOLETE	SSOP (DB) | 20	-40 TO 85	View Contents	1KU |		N/A*		Not Available			
SN74ACT245DBR	ACTIVE	SSOP (DB) | 20	-40 TO 85	View Contents	1KU | 0.32	2000	N/A*	2000 | 21 Oct	8 WKS			
SN74ACT245DW	ACTIVE	SOP (DW) | 20	-40 TO 85	View Contents	1KU | 0.32	25	N/A*	1000 | 21 Oct	8 WKS	Avnet | AMERICA	>1k	BUY NOW
								7700 | 23 Oct		DigiKey | AMERICA	922	BUY NOW
								5000 | 30 Oct				
SN74ACT245DWR	ACTIVE	SOP (DW) | 20	-40 TO 85	View Contents	1KU | 0.32	2000	N/A*	8000 | 18 Oct	8 WKS	DigiKey | AMERICA	>1k	BUY NOW
SN74ACT245N	ACTIVE	PDIP (N) | 20	-40 TO 85	View Contents	1KU | 0.32	20	N/A*	1720 | 18 Oct	8 WKS	Avnet | AMERICA	>1k	BUY NOW

								280 | 21 Oct		DigiKey | AMERICA	344	BUY NOW
SN74ACT245NSR	ACTIVE	SOP (NS) | 20		View Contents	1KU | 0.45	2000	N/A*		8 WKS			
SN74ACT245PWLE	OBSOLETE	TSSOP (PW) | 20	-40 TO 85	View Contents	1KU |		N/A*		Not Available			
SN74ACT245PWR	ACTIVE	TSSOP (PW) | 20	-40 TO 85	View Contents	1KU | 0.32	2000	N/A*	2000 | 03 Oct	8 WKS	DigiKey | AMERICA	>1k	BUY NOW
								8000 | 17 Oct				
								>10k | 14 Nov				

Table Data Updated on: 9/26/2002