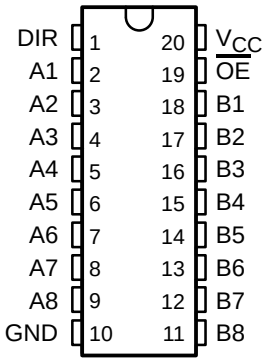
- **State-of-the-Art BiCMOS Design Significantly Reduces I_{CCZ}**
- **ESD Protection Exceeds 2000 V Per MIL-STD-883C, Method 3015; Exceeds 200 V Using Machine Model (C = 200 pF, R = 0)**
- **B Port Has Equivalent 33-Ω Series Resistors, So No External Resistors Are Required**
- **Package Options Include Plastic Small-Outline (DW) and Shrink Small-Outline (DB) Packages and Standard Plastic 300-mil DIPs (N)**

DB, DW, OR N PACKAGE
(TOP VIEW)



description

The SN74BCT2245 octal transceiver and line/MOS driver is designed for asynchronous communication between data buses.

The device allows data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction-control (DIR) input. The output-enable ($\overline{OE}$) input can disable the devices so that both buses are effectively isolated.

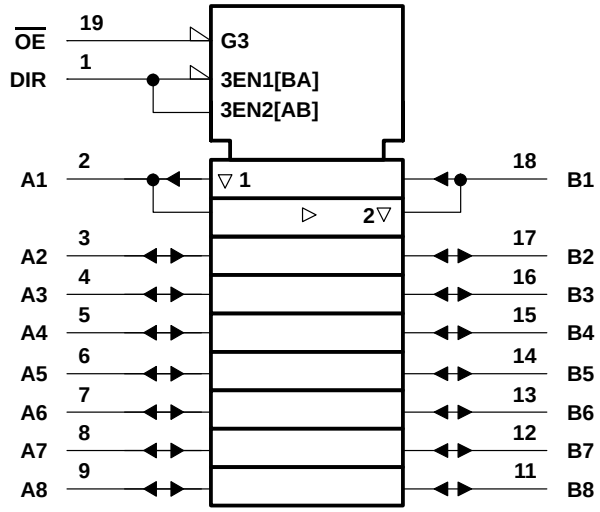
The B-port outputs, which are designed to source or sink up to 12 mA, include 33-Ω series resistors to reduce overshoot and undershoot.

The SN74BCT2245 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

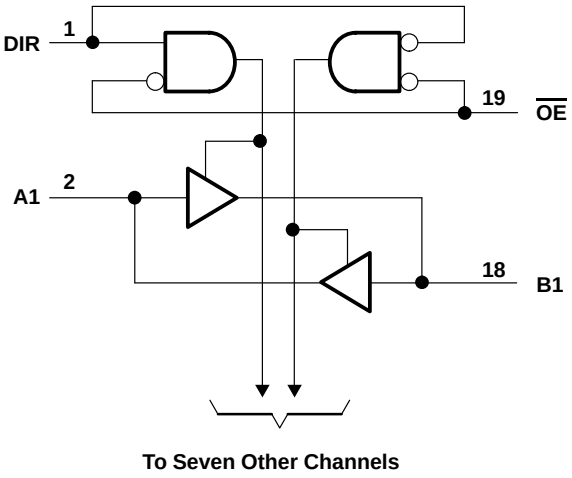
INPUTS		OPERATION
$\overline{OE}$	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

logic symbol†

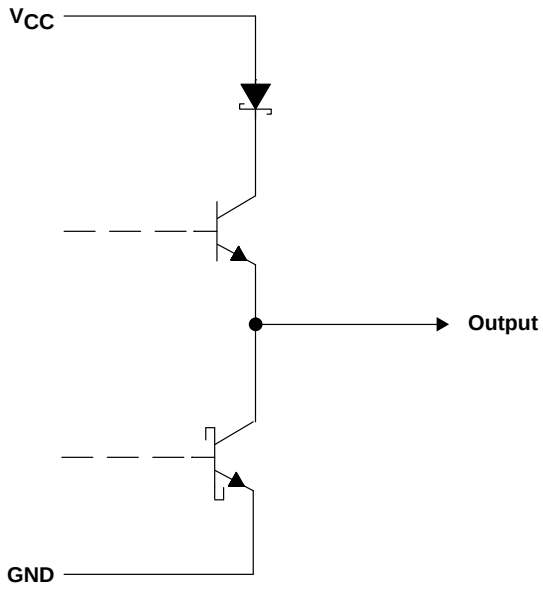


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

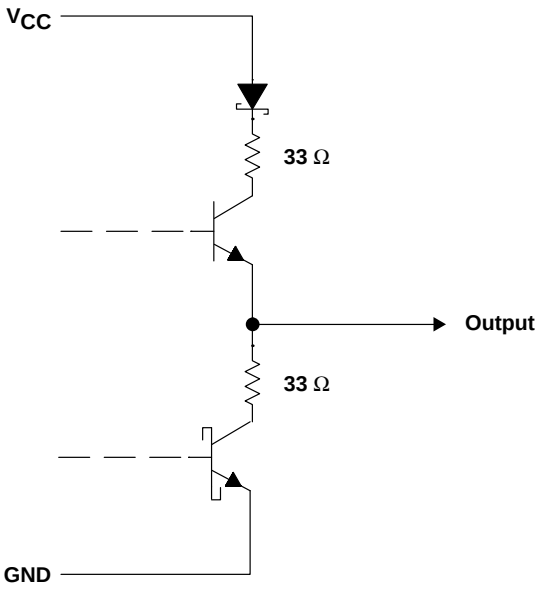
logic diagram (positive logic)



schematic of A-port outputs



schematic of B-port outputs



All resistor values shown are nominal.

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 (except I/O ports) (see Note 1) . . . . . –0.5 V to 7 V
Voltage range applied to any output in the disabled or power-off state, V_O . . . . . –0.5 V to 5.5 V
Voltage range applied to any output in the high state, V_O . . . . . –0.5 V to V_{CC}
Input clamp current, I_{IK} (V_I < 0) . . . . . –30 mA
Current into any output in the low state, I_O . . . . . 60 mA
Operating free-air temperature range . . . . . 0°C to 70°C
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 negative-voltage rating may be exceeded if the input clamp-current rating is observed.

recommended operating conditions (see Note 2)

			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
I_{IK}	Input clamp current				–18	mA
I_{OH}	High-level output current	A port			–3	mA
		B port			–12	
I_{OL}	Low-level output current	A port			24	mA
		B port			12	
T_A	Operating free-air temperature		0		70	°C

NOTE 2: Unused or floating pins (input or I/O) must be held high or low.

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

PARAMETER		TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IK}		V_{CC} = 4.5 V,	I_I = –18 mA			–1.2	V
V_{OH}	A port	V_{CC} = 4.5 V	I_{OH} = –1 mA	2.5	3.4		V
			I_{OH} = –3 mA	2.4	3.3		
	B port	V_{CC} = 4.5 V	I_{OH} = –1 mA	2.4	3.3		
			I_{OH} = –12 mA	2	3.2		
V_{OL}	A port	V_{CC} = 4.5 V,	I_{OL} = 24 mA		0.35	0.5	V
	B port	V_{CC} = 4.5 V	I_{OL} = 1 mA			0.5	
			I_{OL} = 12 mA			0.8	
I_I		V_{CC} = 5.5 V,	V_I = 5.5 V			0.1	mA
I_{IH}‡	A or B port	V_{CC} = 5.5 V,	V_I = ?Ÿ′v			70	µA
	Control input					20	
I_{IL}‡		V_{CC} = 5.5 V,	V_I = 0.5 V			–0.65	mA
I_{OS}§	A port	V_{CC} = 5.5 V,	V_O = 0	–60		–150	mA
	B port			–100		–225	
I_{CCL}	A to B	V_{CC} = 5.5 V,	Outputs open		63	100	mA
	B to A				40	64	
I_{CCH}	A to B	V_{CC} = 5.5 V,	Outputs open		37	59	mA
	B to A				29	46	
I_{CCZ}	A to B	V_{CC} = 5.5 V,	Outputs open		9	15	mA
	B to A				8	14	
C_i	Control input	V_{CC} = 5 V,	V_I = 2.5 V or 0.5 V		7		pF
C_{io}	A to B	V_{CC} = 5 V,	V_O = 2.5 V or 0.5 V		9		pF
	B to A				12		

† 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.
§ Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

switching characteristics over recommended ranges of supply voltage and operating free-air temperature, C_L = 50 pF (unless otherwise noted) (see Note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, T_A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t_{PLH}	A	B	1	3.3	4.9	1	5.8	ns
	B	A	1.7	4.2	6.1	1.7	7	
t_{PHL}	A	B	2.5	5.1	6.9	2.5	7.8	ns
	B	A	2.2	4.7	7.1	2.2	7.7	
t_{PZH}	$\overline{OE}$	B	3.2	6.2	8.6	3.2	9.9	ns
		A	3.8	7.2	9.5	3.8	11.1	
t_{PZL}	$\overline{OE}$	B	5.6	8.3	10.9	5.6	12.2	ns
		A	4.2	7.6	10.1	4.2	11.4	
t_{PHZ}	$\overline{OE}$	B	2.6	5.2	7.1	2.6	8.2	ns
		A	3.1	5.7	8	3.1	9.4	
t_{PLZ}	$\overline{OE}$	B	3.5	6	7.9	3.5	9.2	ns
		A	2.3	4.7	6.5	2.3	7.6	

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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