- **3-State Outputs Drive Bus Lines Directly**
- **Package Options Include Plastic Small-Outline (SOIC) and Shrink Small-Outline (SSOP) Packages, Ceramic Chip Carriers, and Plastic and Ceramic DIPs**

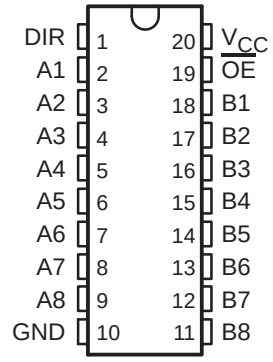
description

These octal bus transceivers are designed for asynchronous 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 logic level at the direction-control (DIR) input. The output enable ($\overline{OE}$) input can be used to disable the device so the buses are effectively isolated.

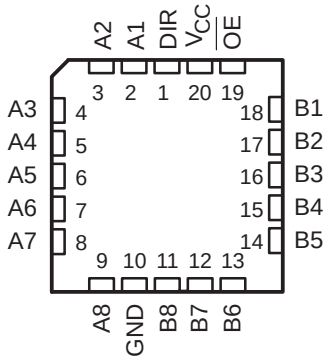
The SN74F245 is available in TI's shrink small-outline package (DB), which provides the same I/O pin count and functionality of standard small-outline packages in less than half the printed-circuit-board area.

The SN54F245 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74F245 is characterized for operation from 0°C to 70°C.

SN54F245 . . . J PACKAGE
SN74F245 . . . DB, DW, OR N PACKAGE
(TOP VIEW)



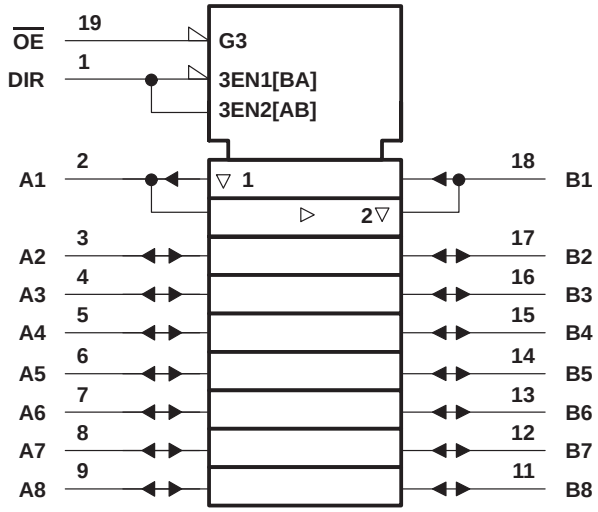
SN54F245 . . . FK PACKAGE
(TOP VIEW)



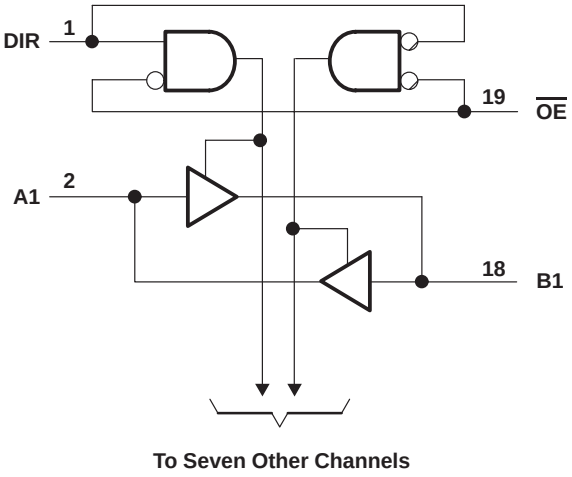
FUNCTION TABLE

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

logic symbol†



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 (except I/O ports) (see Note 1) . . . . . –1.2 V to 7 V
Input current range . . . . . –30 mA to 5 mA
Voltage range applied to any output in the disabled or power-off state . . . . . –0.5 V to 5.5 V
Voltage range applied to any output in the high state . . . . . –0.5 V to V_{CC}
Current into any output in the low state: SN54F245 (A1 thru A8) . . . . . 40 mA
SN54F245 (B1 thru B8) . . . . . 96 mA
SN74F245 (A1 thru A8) . . . . . 48 mA
SN74F245 (B1 thru B8) . . . . . 128 mA
Operating free-air temperature range: SN54F245 . . . . . –55°C to 125°C
SN74F245 . . . . . 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 voltage ratings may be exceeded provided the input current ratings are observed.

recommended operating conditions

			SN54F245			SN74F245			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-level input voltage				0.8			0.8	V
I_{IK}	Input clamp current				–18			–18	mA
I_{OH}	High-level output current	A1 thru A8			– 3			– 3	mA
		B1 thru B8			– 12			– 15	
I_{OL}	Low-level output current	A1 thru A8			20			24	mA
		B1 thru B8			48			64	
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		SN54F245			SN74F245			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}	A1 thru A8	V_{CC} = 4.5 V	I_{OH} = – 1 mA	2.5	3.4		2.5	3.4		V
			I_{OH} = – 3 mA	2.4	3.3		2.4	3.3		
	B1 thru B8	V_{CC} = 4.5 V	I_{OH} = – 12 mA	2	3.2					
			I_{OH} = – 15 mA				2	3.1		
	Any output	V_{CC} = 4.75 V,	I_{OH} = –1 mA to – 3 mA				2.7			
V_{OL}	A1 thru A8	V_{CC} = 4.5 V	I_{OL} = 20 mA		0.3	0.5				V
			I_{OL} = 24 mA					0.35	0.5	
	B1 thru B8	V_{CC} = 4.5 V	I_{OL} = 48 mA		0.38	0.55				
			I_{OL} = 64 mA					0.42	0.55	
I_I	A and B	V_{CC} = 5.5 V	V_I = 5.5 V			1			1	mA
	DIR, $\overline{OE}$		V_I = 7 V			0.1			0.1	
I_{IH}‡	A and B	V_{CC} = 5.5 V,	V_I = 2.7 V			70			70	µA
	DIR, $\overline{OE}$					20			20	
I_{IL}‡	A and B	V_{CC} = 5.5 V,	V_I = 0.5 V			–0.65			–0.65	mA
	DIR, $\overline{OE}$					– 1.2			– 1.2	
I_{OS}§	A1 thru A8	V_{CC} = 5.5 V,	V_O = 0	–60		–150	–60		–150	mA
	B1 thru B8			–100		–225	–100		–225	
I_{CC}		V_{CC} = 5.5 V	Outputs high		70	90		70	90	mA
			Outputs low		95	120		95	120	
			Outputs disabled		85	110		85	110	

† 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 shorted at a time, and the duration of the short circuit should not exceed one second.

switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R_L = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = 500 Ω, T_A = MIN to MAX†				UNIT
			′F245			SN54F245		SN74F245		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1.7	3.8	6	1.2	7.5	1.7	7	ns
t_{PHL}			1.7	4.2	6	1.2	7.5	1.7	7	
t_{PZH}	$\overline{OE}$	A or B	2.2	4.9	7	1.7	9	2.2	8	ns
t_{PZL}			2.7	5.6	8	2.2	10	2.7	9	
t_{PHZ}	$\overline{OE}$	A or B	2.2	4.6	6.5	1.7	9	2.2	7.5	ns
t_{PLZ}			1.2	4.6	6.5	1.2	10	1.2	7.5	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 2: Load circuits and waveforms are shown in Section 1.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
85511012A	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
8551101RA	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
8551101SA	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC
JM38510/34803B2A	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
JM38510/34803BRA	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
JM38510/34803BSA	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC
SN54F245J	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
SN74F245DBLE	OBSOLETE	SSOP	DB	20		None	Call TI	Call TI
SN74F245DBR	ACTIVE	SSOP	DB	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SN74F245DW	ACTIVE	SOIC	DW	20	25	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74F245DWR	ACTIVE	SOIC	DW	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-250C-1 YEAR/ Level-1-235C-UNLIM
SN74F245N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74F245N3	OBSOLETE	PDIP	N	20		None	Call TI	Call TI
SN74F245NSR	ACTIVE	SO	NS	20	2000	Pb-Free (RoHS)	CU NIPDAU	Level-2-260C-1 YEAR/ Level-1-235C-UNLIM
SNJ54F245FK	ACTIVE	LCCC	FK	20	1	None	Call TI	Level-NC-NC-NC
SNJ54F245J	ACTIVE	CDIP	J	20	1	None	Call TI	Level-NC-NC-NC
SNJ54F245W	ACTIVE	CFP	W	20	1	None	Call TI	Level-NC-NC-NC

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - May not be currently available - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
None: Not yet available Lead (Pb-Free).
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Green (RoHS & no Sb/Br): TI defines "Green" to mean "Pb-Free" and in addition, uses package materials that do not contain halogens, including bromine (Br) or antimony (Sb) above 0.1% of total product weight.

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDECindustry standard classifications, and peak solder temperature.

to Customer on an annual basis.

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