

74FR245

Octal Bidirectional Transceiver with TRI-STATE® Outputs

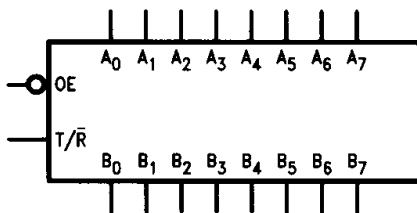
General Description

The 74FR245 contains eight non-inverting bidirectional buffers with TRI-STATE outputs and is intended for bus-oriented applications. Current sinking capability is 64 mA on both the A and B ports. The Transmit/Receive (T/ \bar{R}) input determines the direction of data flow through the bidirectional transceiver. Transmit (active HIGH) enables data from A ports to B ports; Receive (active LOW) enables data from B ports to A ports. The Output Enable input, when HIGH, disables both A and B ports by placing them in a High Z condition.

Features

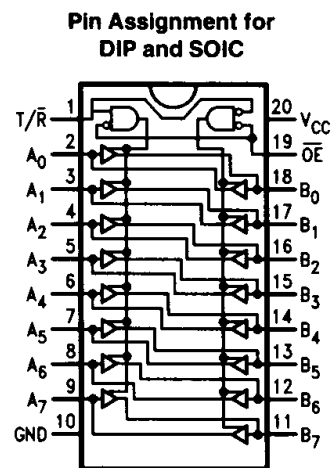
- Non-inverting buffers
- Bidirectional data path
- A and B output sink capability of 64 mA, source capability of 15 mA
- Guaranteed 4000V minimum ESD protection
- Guaranteed pin to pin skew

Logic Symbol



TL/F/10887-1

Connection Diagram



TL/F/10887-2

Pin Descriptions

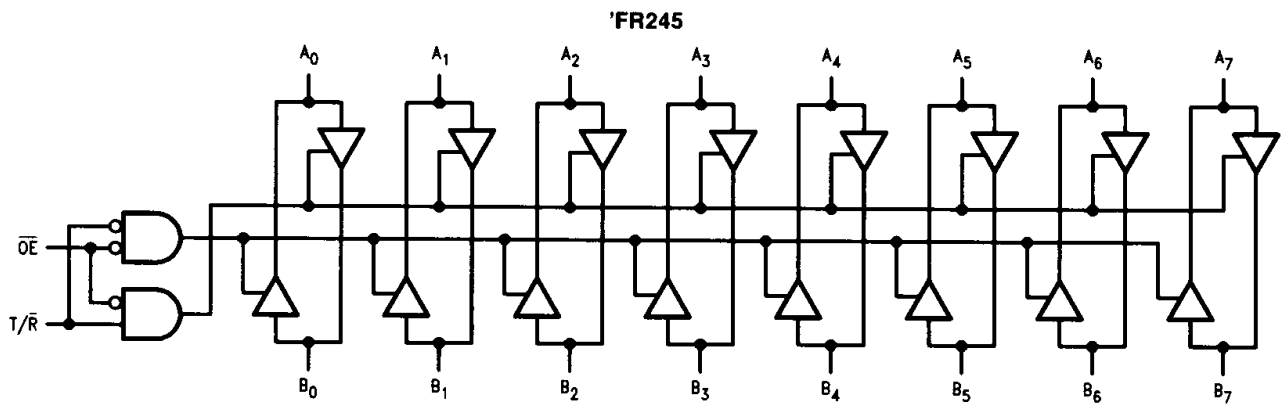
Pin Names	Description
\overline{OE}	Output Enable Input (Active LOW)
T/ \overline{R}	Transmit/Receive Input
A ₀ -A ₇	Side A Inputs or TRI-STATE Outputs
B ₀ -B ₇	Side B Inputs or TRI-STATE Outputs

Truth Table

Inputs		Output
\overline{OE}	T/ \overline{R}	
L	L	Bus B Data to Bus A
L	H	Bus A Data to Bus B
H	X	High Z State

H = HIGH Voltage Level
 L = LOW Voltage Level
 X = Immaterial

Logic Diagram



TL/F/10887-3

AC Electrical Characteristics

Symbol	Parameter	74FR			74FR		Units
		$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A = \text{Comm}$ $V_{CC} = \text{Comm}$ $C_L = 50\text{ pF}$		
		Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay A_n to B_n or B_n to A_n	1.0 1.0	2.6 1.7	3.9 3.9	1.0 1.0	3.9 3.9	ns
t_{PZH} t_{PZL}	Output Enable Time	2.5 2.5	5.0 4.3	7.0 7.0	2.5 2.5	7.0 7.0	ns
t_{PHZ} t_{PLZ}	Output Disable Time	1.7 1.7	3.7 3.6	6.5 6.5	1.7 1.7	6.5 6.5	ns

Extended AC Characteristics

Symbol	Parameter	74FR		74FR		Units
		$T_A = +25^\circ\text{C}$ $V_{CC} = \text{Comm}$ $C_L = 50\text{ pF}$ Eight Outputs Switching (Note 2)		$T_A = \text{Comm}$ $V_{CC} = \text{Comm}$ $C_L = 250\text{ pF}$ (Note 3)		
		Min	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation Delay A_n to B_n or B_n to A_n	1.0 1.0	5.9 5.9	2.5 2.5	7.5 7.5	ns
t_{PZH} t_{PZL}	Output Enable Time	2.5 2.5	11.9 11.9			ns
t_{PHZ} t_{PLZ}	Output Disable Time	1.3 1.3	6.5 6.5			ns
t_{OSHL} (Note 1)	Pin to Pin Skew for HL Transitions		TBD			ns
t_{OSLH} (Note 1)	Pin to Pin Skew for LH Transitions		TBD			ns
t_{OST} (Note 1)	Pin to Pin Skew for HL/LH Transitions		TBD			ns

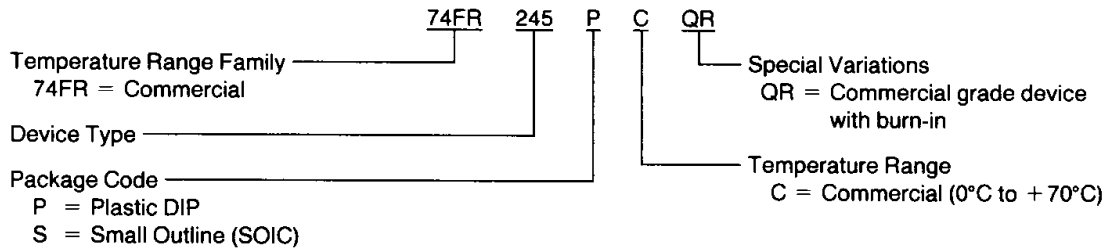
Note 1: Skew is defined as the absolute value of the difference between the actual propagation delays for any two outputs of the same device. The specification applies to any outputs switching high to low (t_{OSHL}), low to high (t_{OSLH}), or any combination of high to low and/or low to high (t_{OST}).

Note 2: This specification is guaranteed but not tested. The limits apply to propagation delays for all paths described switching in phase, i.e., all low-to-high, high-to-low, TRI-STATE-to-high, etc.

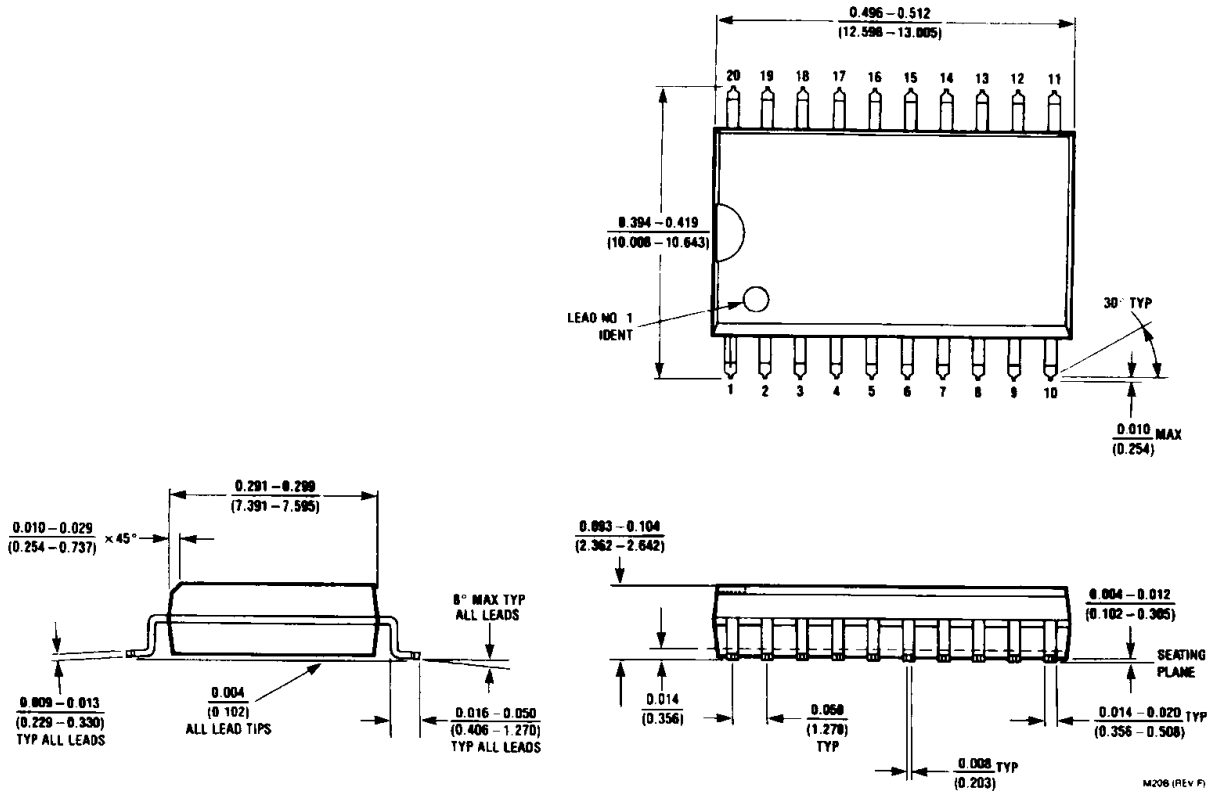
Note 3: These specifications guaranteed but not tested. The limits represent propagation delays with 250 pF load capacitors in place of the 50 pF load capacitors in the standard AC load. This specification pertains to single output switching only.

Ordering Information

The device number is used to form part of a simplified purchasing code where the package type and temperature range are defined as follows:



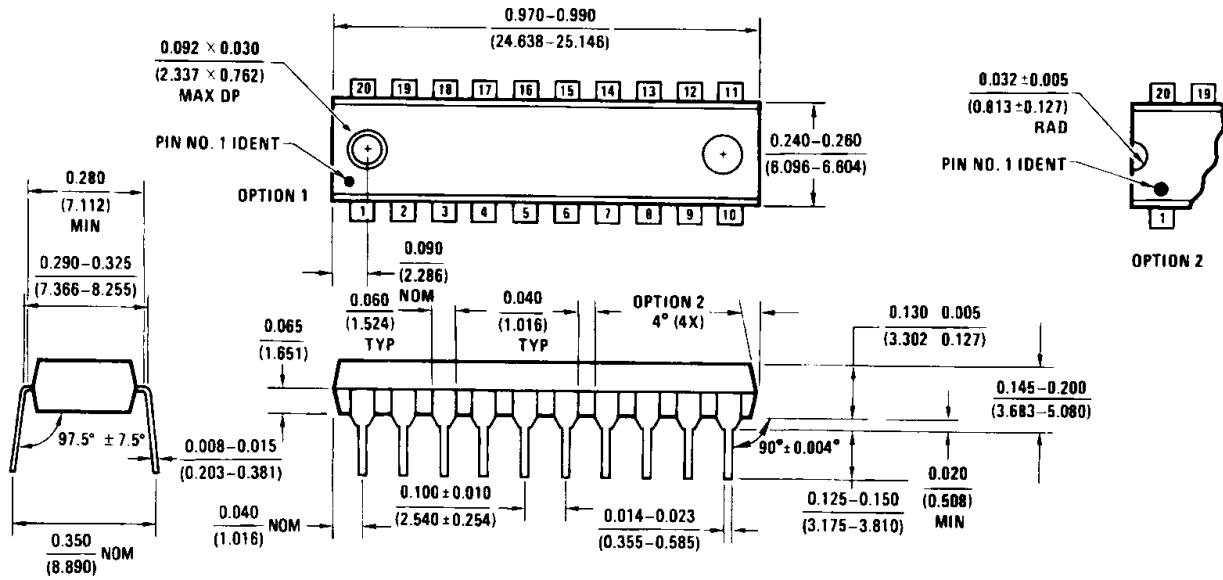
Physical Dimensions inches (millimeters)



**20-Lead Small Outline Integrated Circuit (S)
NS Package Number M20B**

Physical Dimensions inches (millimeters) (Continued)

Lit # 114630



**20-Lead Plastic Dual-In-Line Package (P)
NS Package Number N20B**

N20B (REV A)

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

MAR 1 2 1991



National Semiconductor Corporation
2900 Semiconductor Drive
P.O. Box 58090
Santa Clara, CA 95052-8090
Tel: (408) 721-5000
TWX: (910) 339-9240

National Semiconductor GmbH
Industriestrasse 10
D-8080 Furstenfeldbruck
West Germany
Tel: (0-81-41) 103-0
Telex: 527-649
Fax: (08141) 103554

National Semiconductor Japan Ltd.
Sanseido Bldg. 5F
4-15 Nishi Shinjuku
Shinjuku-Ku,
Tokyo 160, Japan
Tel: 3-299-7001
FAX: 3-299-7000

National Semiconductor Hong Kong Ltd.
Suite 513, 5th Floor
Chinachem Golden Plaza,
77 Mody Road, Tsimshatsui East,
Kowloon, Hong Kong
Tel: 3-7231290
Telex: 52996 NSSEA HX
Fax: 3-3112536

National Semicondutores Do Brasil Ltda.
Av. Brig. Faria Lima, 1383
6.0 Andor-Conj. 62
01451 Sao Paulo, SP, Brasil
Tel: (55/11) 212-5066
Fax: (55/11) 211-1181 NSBR BR

National Semiconductor (Australia) PTY, Ltd.
1st Floor, 441 St. Kilda Rd.
Melbourne, 3004
Victoria, Australia
Tel: (03) 267-5000
Fax: 61-3-2677458