

March 1987 Revised February 2000

DM74ALS645A Octal Bus Transceivers

General Description

These octal bus transceivers are designed for asynchronous two-way communication between data busses. These devices transmit 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 (G) can be used to disable the device so the busses are effectively isolated.

Features

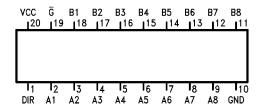
- Advanced Oxide-isolated Ion-implanted Schottky TTL process
- \blacksquare Switching performance is guaranteed over full temperature and V_{CC} supply range
- Switching performance specified at 50 pF
- PNP input design reduces input loading

Ordering Code:

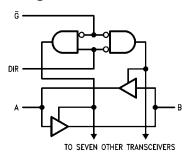
Order Number	Package Number	Package Description
DM74ALS645AWM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
DM74ALS645AN	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



Logic Diagram



Function Table

Control Inputs		Operation
G	DIR	
L	L	B Data to A Bus
L	Н	A Data to B Bus
Н	Х	Isolation

- L = LOW Logic Level
- H = HIGH Logic Level
 X = Either LOW or HIGH Logic Level

Absolute Maximum Ratings(Note 1)

Supply Voltage 7V

Input Voltage;

Control Inputs 7V I/O Ports 5.5V

Operating Free Air Temperature Range $0^{\circ}\text{C to } +70^{\circ}\text{C}$

Storage Temperature Range -65°C to $+150^{\circ}\text{C}$

Typical θ_{JA}

N Package 53.0°C/W M Package 72.0°C/W

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Recommended Operating Conditions

Symbol	Parameter	Min	Тур	Max	Units
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 _{OH}	HIGH Level Output Current			-15	mA
I _{OL}	LOW Level Output Current			24	mA
T _A	Operating Free Air Temperature Range	0		70	°C

Electrical Characteristics

Over Recommended Free Air Temperature Range

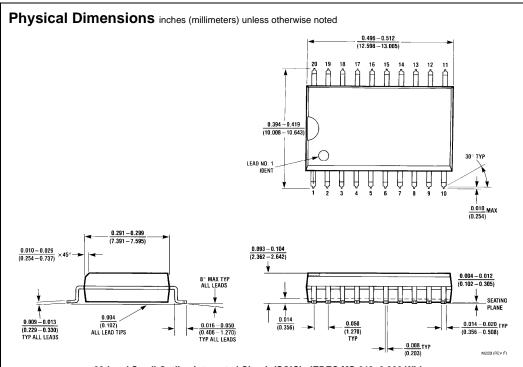
Symbol	Parameter	$V_{CC} = Min, I_I = -18 \; mA$		Min	Тур	Max −1.5	Units V	
V _{IC}	Input Clamp Voltage							
V _{OH}	HIGH Level Output Voltage	$V_{CC} = 4.5 \text{ to } 5.5 \text{V}$	$I_{OH} = -0.4 \text{ mA}$	V _{CC} - 2				
		V _{CC} = Max	$I_{OH} = -3 \text{ mA}$	2.4	3.2		V	
			I _{OH} = Max	2				
V _{OL} LOV	LOW Level Output Voltage	V _{CC} = Min	I _{OL} = 12 mA		0.25	0.4	V	
			I _{OL} = 24 mA		0.35	0.5	V	
I _I Input Current at	Input Current at	V _{CC} = Max	I/O Ports, V _I = 5.5V			100	μА	
	Maximum Input Voltage		Control Inputs, V _I = 7V	ontrol Inputs, V _I = 7V		100	μΛ	
I _{IH}	HIGH Level Input Current	V _{CC} = Max, V _I = 2.7V (Note 2)				20	μΑ	
I _{IL}	LOW Level Input Current	V _{CC} = Max, V _I = 0.4V (Note 2)				-100	μΑ	
Io	Output Drive Current	$V_{CC} = Max$, $V_O = 2.25V$		-30		-112	mA	
Icc	Supply Current	V _{CC} = Max	Outputs HIGH		30	45		
			Outputs LOW		36	55	mA	
			Outputs Disabled		38	58		

Note 2: For I/O ports, I_{IH} and I_{IL} parameters include the 3-STATE output current (I_{OZL} and I_{OZH}).

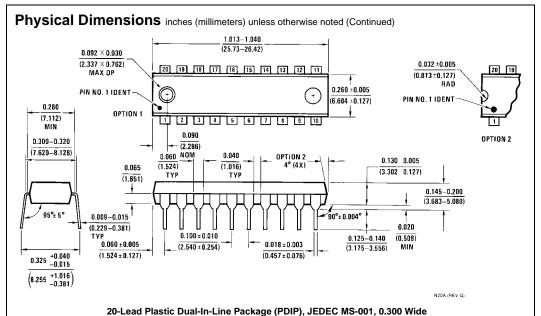
Switching Characteristics

Over Recommended Operating Free Air Temperature Range

Symbol	Parameter	From (Input)	To (Output)	Conditions	Min	Max	Units
^t PLH	Propagation Delay Time LOW-to-HIGH Level Output	A or B	B or A	$V_{CC} = 4.5 \text{ to } 5.5 \text{V},$ $C_L = 50 \text{ pF},$	3	10	ns
t _{PHL}	Propagation Delay Time HIGH-to-LOW Level Output	A or B	B or A	$R1 = R2 = 500\Omega$	3	10	ns
t _{PZH}	Output Enable Time to HIGH Level Output	G	A or B		5	20	ns
t _{PZL}	Output Enable Time to LOW Level Output	G	A or B		5	20	ns
t _{PHZ}	Output Disable Time from HIGH Level Output	G	A or B		2	10	ns
t _{PLZ}	Output Disable Time from LOW Level Output	G	A or B		4	15	ns



20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide Package Number M20B



Package Number N20A

Fairchild does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and Fairchild reserves the right at any time without notice to change said circuitry and specifications.

LIFE SUPPORT POLICY

FAIRCHILD'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 FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

- 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 (c) 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.
- A critical component in 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.

www.fairchildsemi.com