FAIRCHILD

SEMICONDUCTOR

DM74LS645 Octal Bus Transceiver

General Description

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

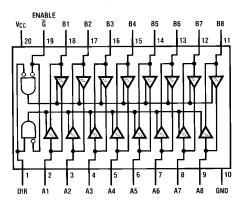
August 1986 Revised March 2000

DM74LS645 Octal Bus Transceiver

Ordering Code:

Order Number	Package Number	Package Description
DM74LS645WM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
DM74LS645N	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



Function Table

Features

packages

■ 3-STATE outputs

	ntrol puts	DM74LS645
G	DIR	
L	L	B data to A bus
L	Н	A data to B bus
н	х	Isolation

■ Bi-directional bus transceivers in high-density 20-pin

Hysteresis at bus inputs improves noise margins

H = HIGH Level L = LOW Level X = Irrelevant

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Absolute Maximum Ratings(Note 1)

Supply Voltage	7V	
Input Voltage	7V	
Operating Free Air Temperature Range	$0^{\circ}C$ to $+70^{\circ}C$	
Storage Temperature Range	-55°C to +150°C	

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	Nom	Max	Units
/ _{cc}	Supply Voltage (Note 2)	4.75	5	5.25	V
′ін	HIGH Level Input Voltage	2			V
'IL	LOW Level Input Voltage			0.6	V
ЭН	HIGH Level Output Current			-15	mA
DL	LOW Level Output Current			24	mA
A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

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

Symbol	Parameter	Co	onditions (No	e 3)	Min	Typ (Note 4)	Max	Units
VI	Input Clamp Voltage	$V_{CC} = Min, I_I = 18$	mA				-1.5	V
H _{YS}	Hysteresis (V _{T+} – V_) A or B Input	V _{CC} = Min			0.2	0.4		V
V _{OH}	HIGH Level Output Voltage	$V_{CC} = Min, V_{IH} = 2$	2V,	$I_{OH} = -3 \text{ mA}$	2.4	3.4		v
		V _{IL} = Max		I _{OH} = Max	2			•
V _{OL}	LOW Level Output Voltage	$V_{CC} = Min, V_{IH} = 2$	2V,	$I_{OL} = 12 \text{ mA}$		0.25	0.4	V
		V _{IL} = Max		I _{OL} = 24 mA		0.35	0.5	v
I _{OZH}	Off-State Output Current,	V _{CC} = Max, G at 2	2V,	•			20	μA
	HIGH Level Voltage Applied	$V_0 = 2.7V$					20	μΑ
I _{OZL}	Off-State Output Current,	V _{CC} = Max, G at 2	2V				-400	μA
	LOW Level Voltage Applied	$V_0 = 0.4V$					-400	μΑ
l _l	Input Current at	V _{CC} = Max	A or B	$V_{I} = 5.5V$			0.1	~^^
	Maximum Input Voltage		DIR or G	$V_I = 7V$			0.1	mA
IIH	HIGH Level Input Current	$V_{CC} = Max, V_{IH} =$	2.7	•			20	μΑ
IIL	LOW Level Input Current	$V_{CC} = Max, V_{IL} =$	0.4V				-0.4	mA
I _{OS}	Short Circuit Output Current (Note 5)	V _{CC} = Max			-40		-225	mA
I _{CC}	Total Supply	Outputs HIGH		V _{CC} = Max,		48	70	
	Current	Outputs LOW		Outputs Open		62	90	mA
		Outputs at Hi-Z		-		64	95	

Note 3: For conditions shown as Min or Max, use the appropriate value specified under Recommended Operating Conditions.

Note 4: All typicals are at $V_{CC}=5V,\,T_A=25^\circ C.$

Note 5: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Image: Section product of the propagation Delay Time LOW-to-HIGH Level Output A to B 15 Image: Section product of the propagation Delay Time HIGH-to-LOW Level Output A to B 15 Image: Section product of the propagation Delay Time HIGH-to-LOW Level Output A to B 15 Image: Section product of the propagation Delay Time HIGH-to-LOW Level Output B to A 15 Image: Section product of the propagation Delay Time LOW-to-HIGH Level Output B to A 15 Image: Section product of the propagation Delay Time LOW-to-HIGH Level Output B to A 15 Image: Section product of the propagation Delay Time LOW-to-HIGH Level Output B to A 15 Image: Section product of the propagation Delay Time HIGH-to-LOW Level Output B to A 15 Image: Section product of the propagation Delay Time HIGH-to-LOW Level Image: Section product of the propagation Delay Time HIGH-to-LOW Level Image: Section product of the propagation Delay Time HIGH-to-LOW Level Image: Section product of the propagation Delay Time HIGH-to-LOW Level Image: Section product of the propagation Delay Time HIGH-to-LOW Level Image: Section product of the propagation product of the	MinMaxMinMaxHPropagation Delay Time LOW-to-HIGH Level OutputA to B1515nsLPropagation Delay Time HIGH-to-LOW Level OutputA to B1515nsHPropagation Delay Time LOW-to-HIGH Level OutputB to A1515nsLPropagation Delay Time HIGH-to-LOW Level OutputB to A1515nsLPropagation Delay Time HIGH-to-LOW Level OutputB to A1515nsLOutput Enable Time to LOW LevelG to A4015nsHOutput Enable Time to HIGH LevelG to B4015nsLOutput Enable Time to HIGH LevelG to B4015nsLOutput Enable Time to LOW LevelG to B4015nsLOutput Enable Time to LOW LevelG to B4015nsLOutput Enable Time to LOW LevelG to B4015nsZOutput Disable Time to LOW LevelG to A25nsZOutput Disable Time to LOW LevelG to B25nsZOutput Disable Time to LOW LevelG to B25nsZOutput Disable Time to LOW LevelG to B151525ZOutput Disable Time to LOW LevelG to B25nsZOutput Disable Time to LOW LevelG to B151525ZOutput Disable Time to LOW L	MinMaxMinMaxHPLHPropagation Delay Time LOW-to-HIGH Level OutputA to B1515nsHPHLPropagation Delay Time HIGH-to-LOW Level OutputA to B1515nsHPLHPropagation Delay Time HIGH-to-LOW Level OutputB to A1515nsHPHLPropagation Delay Time LOW-to-HIGH Level OutputB to A1515nsHPHLPropagation Delay Time HIGH-to-LOW Level OutputB to A4015nsHPHLOutput Enable Time to LOW LevelG to A4015nsHPZLOutput Enable Time to LOW LevelG to B4015nsHPZLOutput Enable Time to LOW LevelG to A4015nsHPZLOutput Disable Time to LOW LevelG to A4025nsHPZLOutput Disable Time to HIGH LevelG to A1525nsHPZLOutput Disable Time to HIGH LevelG to B25nsHPZOutput Disable Time to HIGH LevelG to B25nsHPZOutput Disable Time to HIGH LevelG to B25nsHPZOutput Disable Time to HIGH Lev		V and T _A = 25°C	From (Input)		R _L =	667 Ω		
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