National Semiconductor

DM74LS243 Quadruple Bus Transceiver

General Description

This four data line transceiver is designed for asynchronous two-way communications between data buses. It can be used to drive terminated lines down to 133Ω .

Features

- Two-way asynchronous communication between data buses
- PNP inputs reduce DC loading on bus line
- Hysteresis at data inputs improves noise margin

Connection Diagram



TL/F/6412-1

Order Number DM74LS243WM or DM74LS243N See NS Package Number M14B or N14A

Function Table

Cor Inp	ntrol outs	Data Sta	Port itus
GAB	GBA	A	В
н	н	0	I
L	н	*	*
н	L	ISOL	ATED
L	L	1 1	0

*Possibly destructive oscillation may occur if the transceivers are enabled in both directions at once.

I = Input, O = Output.

H = High Logic Level, L = Low Logic Level.

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

7V
7V
5.5V
0°C to +70°C
-65°C to +150°C

Note: 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" table 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		Unite		
Cymbol		Min	Nom	Max	O into
V _{CC}	Supply Voltage	4.75	5	5.25	v
VIH	High Level Input Voltage	2			v
VIL	Low Level Input Voltage			0.8	v
юн	High Level Output Current			-15	mA
IOL	Low Level Output Current			24	mA
Τ _Α	Free Air Operating Temperature	0		70	°C

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

Symbol	Parameter	с	onditions		Min	Typ (Note 1)	Max	Units
VI	Input Clamp Voltage	$V_{CC} = Min, I_I$	= - 18 mA				-1.5	V
HYS	Hysteresis (V _{T+} - V _{T-}) (Data Inputs Only)	$V_{CC} = Min$			0.2	0.4		v
V _{OH}	High Level Output Voltage	$V_{CC} = Min, V_{I}$ $V_{IL} = Max, I_{OI}$	_H = Min _H = -1 mA		2.7			
		$V_{CC} = Min, V_{I}$ $V_{IL} = Max, I_{OI}$	_H = Min _H = -3 mA		2.4	3.4		v
		$V_{CC} = Min, V_{I}$ $V_{IL} = 0.5V, I_{O}$	_H = Min _H = Max		2			
VOL	Low Level Output Voltage	V _{CC} = Min	l _{OL} = 12 mA	4			0.4	
		V _{IL} = Max V _{IH} = Min	I _{OL} = Max				0.5	v
lozh	Off-State Output Current, High Level Voltage Applied	V _{CC} = Max V _{IL} = Max	V _O = 2.7V				40	μΑ
lozl	Off-State Output Current, Low Level Voltage Applied	V _{IH} = Min	$V_{O} = 0.4V$				-200	μΑ
4	Input Current at Maximum	V _{CC} = Max	V _I = 5.5V	A or B			0.1	mA
	Input Voltage		V ₁ = 7V	Any G			0.1	mA
Чн	High Level Input Current	V _{CC} = Max, V	′ _I = 2.7V				20	μA
l _{IL}	Low Level Input Current	$V_{CC} = Max, V_I = 0.4V$				-0.2	mA	
los	Short Circuit Output Current	V _{CC} = Max (Note 2)		-40		-225	mA	
lcc	Supply Current	V _{CC} = Max Outputs Open	Outputs High	n		22	38	
			Outputs Low	/		29	50 mA	
			Outputs Disa	abled		32	54	
Note 1. All i								

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics at $V_{CC} = 5V$, $T_A = 25^{\circ}C$ (See Section 1 for Test Waveforms and Output Load)					
Symbol	Parameter	Conditions	Min	Max	Units
t _{PLH}	Propagation Delay Time Low to High Level Output	$C_L = 45 pF$ $R_L = 667 \Omega$		18	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	$C_L = 45 pF$ $R_L = 667 \Omega$		18	ns
t _{PZL}	Output Enable Time to Low Level	$C_L = 45 pF$ $R_L = 667 \Omega$		30	ns
t _{PZH}	Output Enable Time to High Level	$C_L = 45 pF$ $R_L = 667 \Omega$		23	ns
^t PLZ	Output Disable Time from Low Level	$C_{L} = 5 \text{ pF}$ $R_{L} = 667\Omega$		25	ns
^t рнz	Output Disable Time from High Level	$C_L = 5 pF$ $R_L = 667\Omega$		18	ns
t _{PLH}	Propagation Delay Time Low to High Level Output	$C_L = 150 \text{ pF}$ $R_L = 667\Omega$		21	ns
^t PHL	Propagation Delay Time High to Low Level Output	$C_{L} = 150 \text{ pF}$ $R_{L} = 667\Omega$		22	ns
t _{PZL}	Output Enable Time to Low Level	$C_{L} = 150 \text{ pF}$ $R_{L} = 667\Omega$		33	ns
^t PZH	Output Enable Time to High Level	$C_L = 150 \text{ pF}$ $R_L = 667\Omega$		26	ns

LS243