



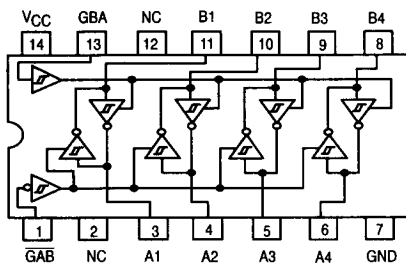
Quad Bus Transceivers With 3-State Outputs

ELECTRICALLY TESTED PER:
MIL-M-38510/32801

The 54LS242 is a Quad Bus Transmitter/Receiver designed for 4-line asynchronous 2-way data communications between data buses.

- Hysteresis at Inputs to Improve Noise Margins
- 2-Way Asynchronous Data Bus Communications
- Input Clamp Diodes Limit High-Speed Termination Effects

LOGIC DIAGRAM



TRUTH TABLE

Inputs		Output
GAB	D	
L	L	H
L	H	L
H	X	(Z)

TRUTH TABLE

Inputs		Output
GBA	D	
L	X	(Z)
H	L	H
H	H	L

H = HIGH Voltage Level

L = LOW Voltage Level

X = Immaterial

Z = HIGH Impedance

Military 54LS242



AVAILABLE AS:

- 1) JAN: JM38510/32801BXA
- 2) SMD: 8002001
- 3) 883: 54LS242/BXAJC

X = CASE OUTLINE AS FOLLOWS:
PACKAGE: CERDIP: C
CERFLAT: D
LCC: 2

**THE LETTER "M" APPEARS
BEFORE THE / ON LCC.**

PIN ASSIGNMENTS

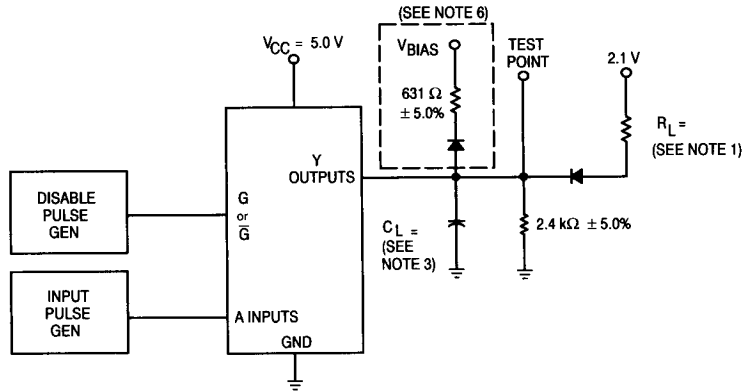
FUNCT.	DIL 632-08	FLATS 717-04	LCC 756A-02	BURN-IN (COND. A)
GAB	1	1	2	VCC
NC	2	2	3	VCC
A1	3	3	4	VCC
A2	4	4	6	VCC
A3	5	5	8	VCC
A4	6	6	9	VCC
GND	7	7	10	GND
B4	8	8	12	GND
B3	9	9	13	GND
B2	10	10	14	GND
B1	11	11	16	GND
NC	12	12	18	VCC
GBA	13	13	19	VCC
VCC	14	14	20	VCC

BURN-IN CONDITIONS:

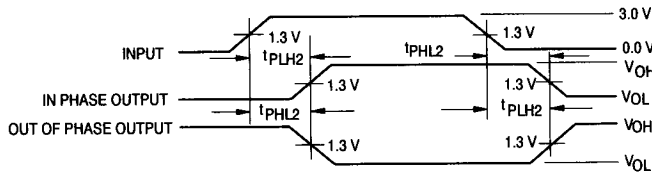
VCC = 5.0 MIN/6.0 V MAX

54LS242

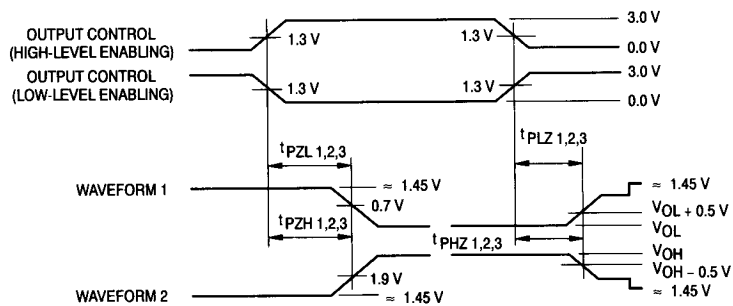
AC TEST CIRCUIT



VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES



VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES, THREE-STATE OUTPUTS



REFERENCE NOTES ON PAGE 5-305

MOTOROLA MILITARY FAST/LS/TTL DATA
5-303

54LS242

Symbol	Parameter	Limits						Unit	Test Condition (Unless Otherwise Specified)
	Static Parameters:	+ 25°C		+ 125°C		– 55°C			
		Subgroup 1		Subgroup 2		Subgroup 3			
		Min	Max	Min	Max	Min	Max		
V _{OHH}	Logical "1" Output Voltage	2.4		2.4		2.4		V	V _{CC} = 4.5 V, I _{OH} = – 3.0 mA, V _{IN} = 2.0 V (all inputs), GAB/GBA = 0.7 V or 2.0 V per truth table.
V _{OHL}	Logical "1" Output Voltage	2.0		2.0		2.0		V	V _{CC} = 4.5 V, I _{OH} = – 12 mA, V _{IN} 0.5 V (all inputs), GAB/GBA = 2.0 V or 0.5 V per truth table.
V _{OL}	Logical "0" Output Voltage		0.4		0.4		0.4	V	V _{CC} = 4.5 V, I _{OL} = 12 mA, V _{IN} = 2.0 V (all inputs), GAB/GBA = 2.0 V or 0.7 V per truth table.
V _{IC}	Input Clamping Voltage		– 1.5					V	V _{CC} = 4.5 V, I _{IN} = – 18 mA, other inputs are open, GAB/GBA = GND, open, 5.5 V, 4.5 V per truth table.
I _{IH}	Logical "1" Input Current		20		20		20	μA	V _{CC} = 5.5 V, V _{IH} = 2.7 V, other inputs are open, GAB/GBA = 5.5 V, 2.7 V or GND per truth table.
I _{IHH}	Logical "1" Input Current		100		100		100	μA	V _{CC} = 5.5 V, V _{IHH} = 5.5 V, other inputs are open, GAB/GBA = 0 V, 4.5 V, 5.5 V or open per truth table.
I _{IL}	Logical "0" Input Current	0	– 150	0	– 150	0	– 150	μA	V _{CC} = 5.5 V, V _{IN} = 0.4 V, other inputs are open, GAB/GBA = GND, 0.4 V, 4.5 V, 5.5 V per truth table.
I _{OS}	Output Short Circuit Current	– 40	– 225	– 40	– 225	– 40	– 225	mA	V _{CC} = 5.5 V, V _{IN} = GND, other inputs are open, GAB/GBA = GND or 4.5 V per truth table.
I _{IOZH}	Output Off Current High		20		20		20	μA	V _{CC} = 5.5 V, V _{IN} = 2.7 V, other inputs are open, GAB = 2.0 V or open, GBA = 0.7 V or open.
I _{IOZL}	Output Off Current Low		– 200		– 200		– 200	μA	V _{CC} = 5.5 V, V _{IN} = 0.4 V, other inputs are open, GAB = 2.0 V or open, GBA = 0.7 V or open.
I _{CCH}	Power Supply Current		38		38		38	mA	V _{CC} = 5.5 V, V _{IN} = GND (all inputs) GAB/GBA = GND.
I _{CCL}	Power Supply Current		50		50		50	mA	V _{CC} = 5.5 V, V _{IN} = 5.5 V (all inputs), GAB/GBA = GND.
I _{CCZ}	Power Supply Current Off		50		50		50	mA	V _{CC} = 5.5 V, all inputs are open, GAB = 5.5 V, GBA = GND.
V _{IH}	Logical "1" Input Voltage	2.0		2.0		2.0		V	V _{CC} = 4.5 V.
V _{IL}	Logical "0" Input Voltage		0.7		0.7		0.7	V	V _{CC} = 4.5 V.
	Functional Tests	Subgroup 7		Subgroup 8A		Subgroup 8B			per Truth Table with V _{CC} = 5.0 V, V _{INL} = 0.4 V, and V _{INH} = 2.4 V.

MOTOROLA MILITARY FAST/LS/TTL DATA

5-304

54LS242

Symbol	Parameter	Limits						Unit	Test Condition (Unless Otherwise Specified)
	Switching Parameters:	+ 25°C		+ 125°C		– 55°C			
		Subgroup 9		Subgroup 10		Subgroup 11			
		Min	Max	Min	Max	Min	Max		
t _{PHL2} t _{PHL2}	Propagation Delay /Data-Output Output <u>High-Low</u>	2.0 —	23 18	2.0 —	30 25	2.0 —	30 25	ns	V _{CC} = 5.0 V, C _L = 50 pF, R _L = 110 Ω. V _{CC} = 5.0 V, C _L = 45 pF, R _L = 667 Ω.
t _{PLH2} t _{PLH2}	Propagation Delay /Data-Output Output <u>Low-High</u>	2.0 —	19 14	2.0 —	25 20	2.0 —	25 20	ns	V _{CC} = 5.0 V, C _L = 50 pF, R _L = 110 Ω. V _{CC} = 5.0 V, C _L = 45 pF, R _L = 667 Ω.
t _{PLZ1} t _{PLZ1}	Propagation Delay /Data-Output Output <u>Low-High</u>	2.0 —	20 25	2.0 —	39 34	2.0 —	39 34	ns	V _{CC} = 5.0 V, C _L = 50 pF, R _L = 110 Ω. V _{CC} = 5.0 V, C _L = 45 pF, R _L = 667 Ω.
t _{PHZ1} t _{PHZ1}	Propagation Delay /Data-Output Output <u>High-Low</u>	2.0 —	35 18	2.0 —	46 41	2.0 —	46 41	ns	V _{CC} = 5.0 V, C _L = 50 pF, R _L = 110 Ω. V _{CC} = 5.0 V, C _L = 45 pF, R _L = 667 Ω.
t _{PZL1} t _{PZL1}	Propagation Delay /Data-Output Output <u>Low-High</u>	2.0 —	35 30	2.0 —	46 41	2.0 —	46 41	ns	V _{CC} = 5.0 V, C _L = 50 pF, R _L = 110 Ω. V _{CC} = 5.0 V, C _L = 45 pF, R _L = 667 Ω.
t _{PZH1} t _{PZH1}	Propagation Delay /Data-Output Output <u>High-Low</u>	2.0 —	28 23	2.0 —	36 31	2.0 —	36 31	ns	V _{CC} = 5.0 V, C _L = 50 pF, R _L = 110 Ω. V _{CC} = 5.0 V, C _L = 45 pF, R _L = 667 Ω.

NOTES:

NOTES:

- R_L = 110 Ω ± 5.0%
- All diodes are 1N3064 or equivalent.
- C_L = 50 pF ± 10% including probe and jig capacitance.
- The pulse generators have the following characteristics:
V_{gen} = 3.0 V, PRR ≤ 1.0 MHz, t_r ≤ 15 ns, t_f = 6.0 ns, Z_{OUT} = 50 Ω.
- Clock pulse characteristics: t_p(clock) = 20 ns, t_{setup} = 20 ns.
- The diode and resistor shown within the dotted area are optional. When the diode and resistor are used, V_{BIAS} shall be 5.5 V for all tests except for t_{PHZ}, for t_{PHZ} tests, V_{BIAS} shall be – 0.6 V.