

HD74LS242

Quadruple Bus Transceivers (with three-state outputs)

REJ03D0461-0300

Rev.3.00

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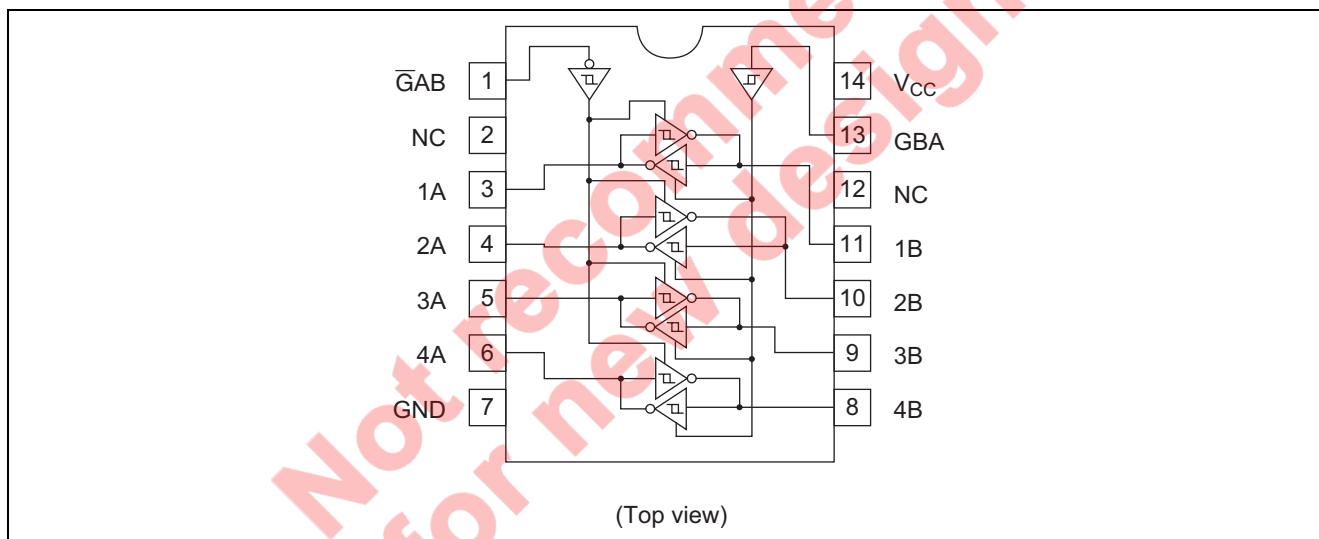
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS242P	DILP-14 pin	PRDP0014AB-B (DP-14AV)	P	—
HD74LS242FPEL	SOP-14 pin (JEITA)	PRSP0014DF-B (FP-14DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

Pin Arrangement



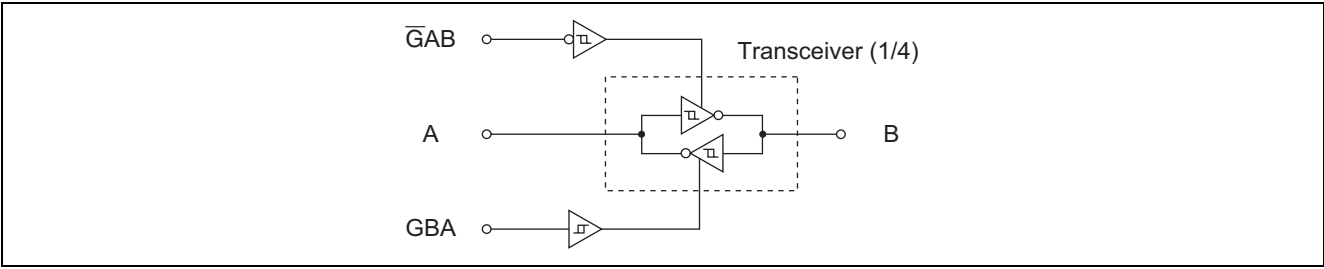
Function Table

Control input		Data port status	
\overline{GAB}	GBA	A	B
H	H	Inverting output	Input
L	H	*	
H	L	Isolated	Isolated
L	L	Input	Inverting output

Notes: 1. H; high level, L; low level

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

Block Diagram



Absolute Maximum Ratings

Item		Symbol	Ratings	Unit
Supply voltage		V_{CC}	7	V
Input voltage	\overline{GAB} , GBA	V_{IN}	7	V
	A, B	V_{IN}	5.5	V
Power dissipation		P_T	400	mW
Storage temperature		T_{stg}	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.75	5.00	5.25	V
Output current	I_{OH}	—	—	-15	mA
	I_{OL}	—	—	24	mA
Operating temperature	T_{opr}	-20	25	75	°C

Electrical Characteristics

(Ta = -20 to +75 °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	V _{IH}	2.0	—	—	V	
	V _{IL}	—	—	0.8	V	
Hysteresis	V _T ⁺ - V _T ⁻	0.2	0.4	—	V	V _{CC} = 4.75 V
Output voltage	V _{OH}	2.4	—	—	V	V _{IL} = 0.8 V, I _{OH} = -3 mA
		2	—	—		V _{IL} = 0.5 V, I _{OH} = -15 mA
	V _{OL}	—	—	0.4	V	I _{OL} = 12 mA
		—	—	0.5		I _{OL} = 24 mA
Off-state output current	I _{OZH}	—	—	40	μA	V _O = 2.7 V
	I _{OZL}	—	—	-200		V _O = 0.4 V
Input current	I _{IH}	—	—	20	μA	V _{CC} = 5.25 V, V _I = 2.7 V
	A Input	—	—	-0.2	mA	V _{CC} = 5.25 V, V _I = 0.4 V, $\overline{\text{GAB}}$ or GBA at GND
	B Input	—	—	-0.2		V _{CC} = 5.25 V, V _I = 0.4 V, $\overline{\text{GAB}}$ or GBA at 4.5 V
	$\overline{\text{GAB}}$ or GBA	—	—	-0.2		V _{CC} = 5.25 V, V _I = 0.4 V
	A or B	—	—	0.1	mA	V _{CC} = 5.25 V, V _I = 5.5 V
	$\overline{\text{GAB}}$ or GBA	—	—	0.1		V _{CC} = 5.25 V, V _I = 7 V
Short-circuit output current	I _{OS}	-40	—	-225	mA	V _{CC} = 5.25 V
Supply current**	I _{CCH}	—	22	38	mA	V _{CC} = 5.25 V
	I _{CCL}	—	29	50		
	I _{CCZ}	—	29	50		
Input clamp voltage	V _{IK}	—	—	-1.5	V	V _{CC} = 4.75 V, I _{IN} = -18 mA

Notes: * V_{CC} = 5 V, Ta = 25°C** With all outputs open, I_{CC} is measured with transceivers enabled in one direction only, or with all transceivers disabled.

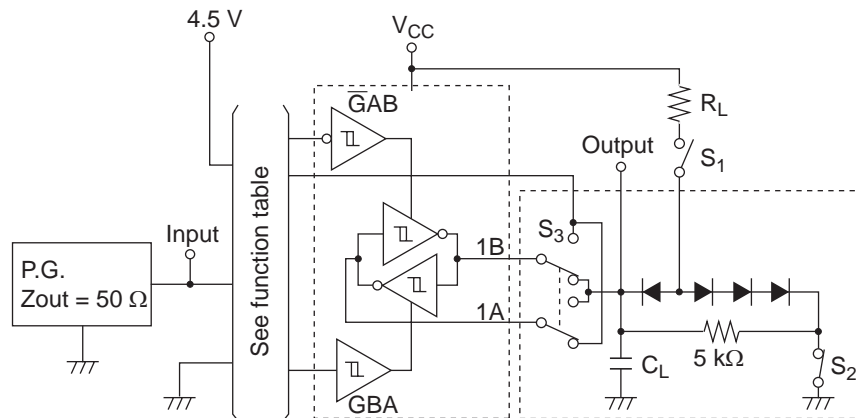
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

Item	Symbol	min.	typ.	max.	Unit	Condition
Propagation delay time	t _{PLH}	—	9	14	ns	C _L = 45 pF, R _L = 667 Ω
	t _{PHL}	—	12	18		
Output enable time	t _{ZL}	—	20	30		
	t _{ZH}	—	15	23		
Output disable time	t _{LZ}	—	15	25		C _L = 5 pF, R _L = 667 Ω
	t _{HZ}	—	10	18		

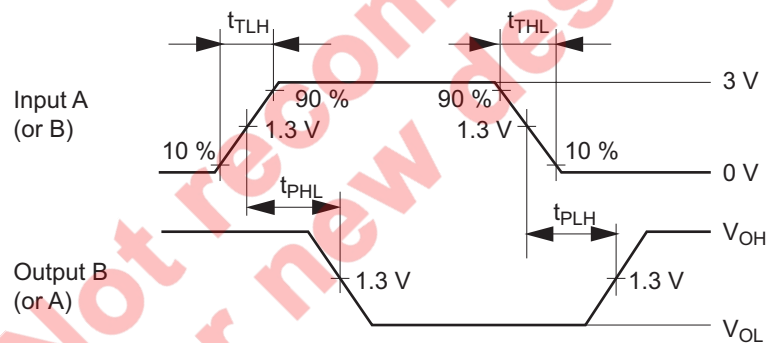
Testing Method

Test Circuit



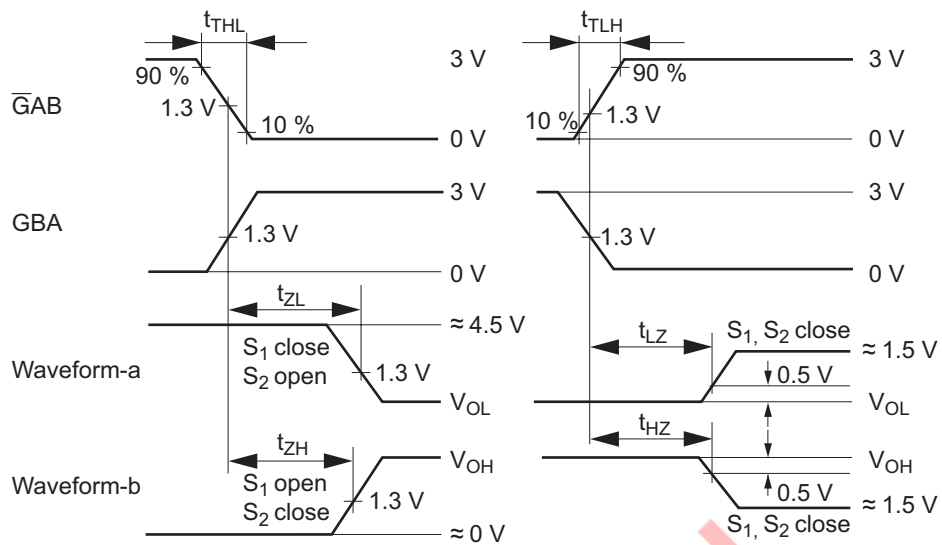
- Notes:
1. 2A-2B, 3A-3B, 4A-4B are identical to above load circuit.
 2. C_L includes probe and jig capacitance.
 3. S_3 is a input-output switch.
 4. All diodes are 1S2074(H).

Waveforms 1



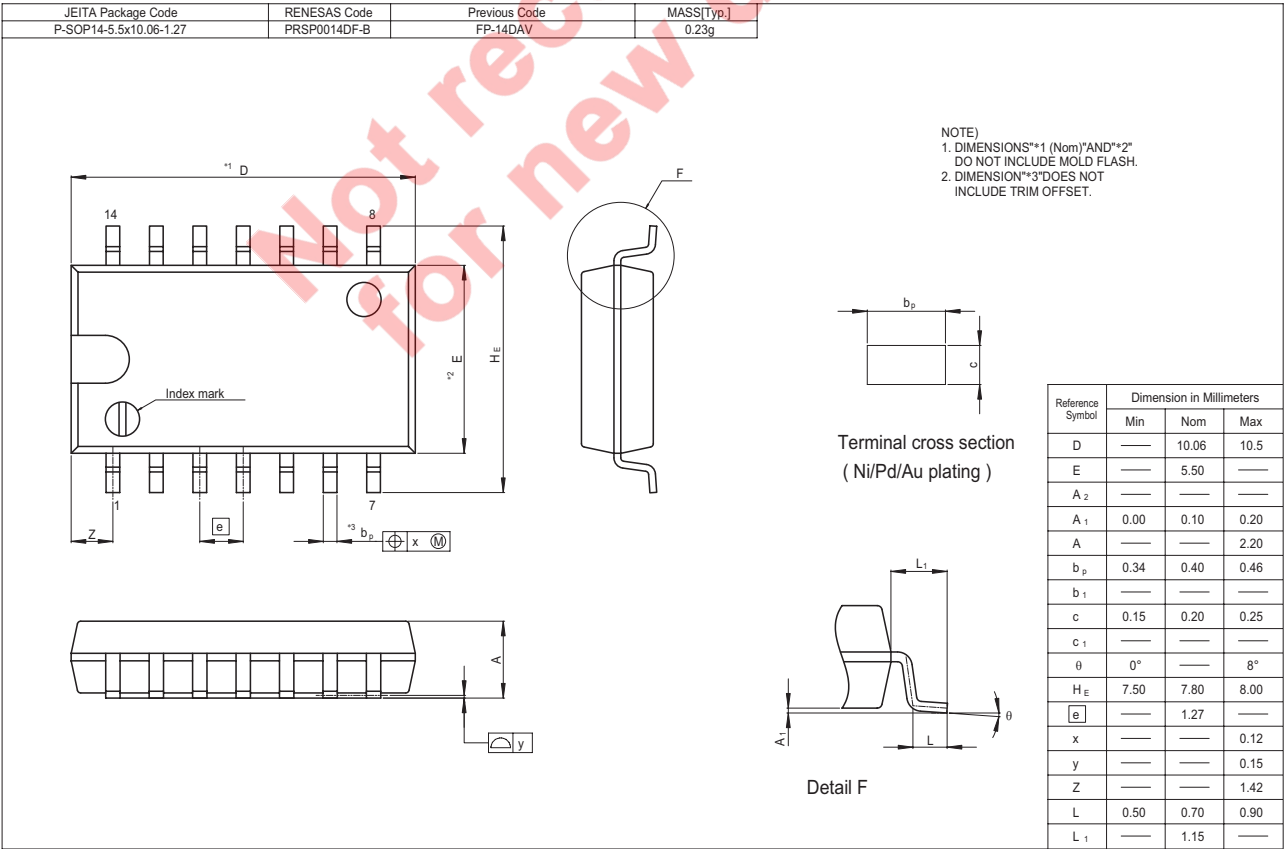
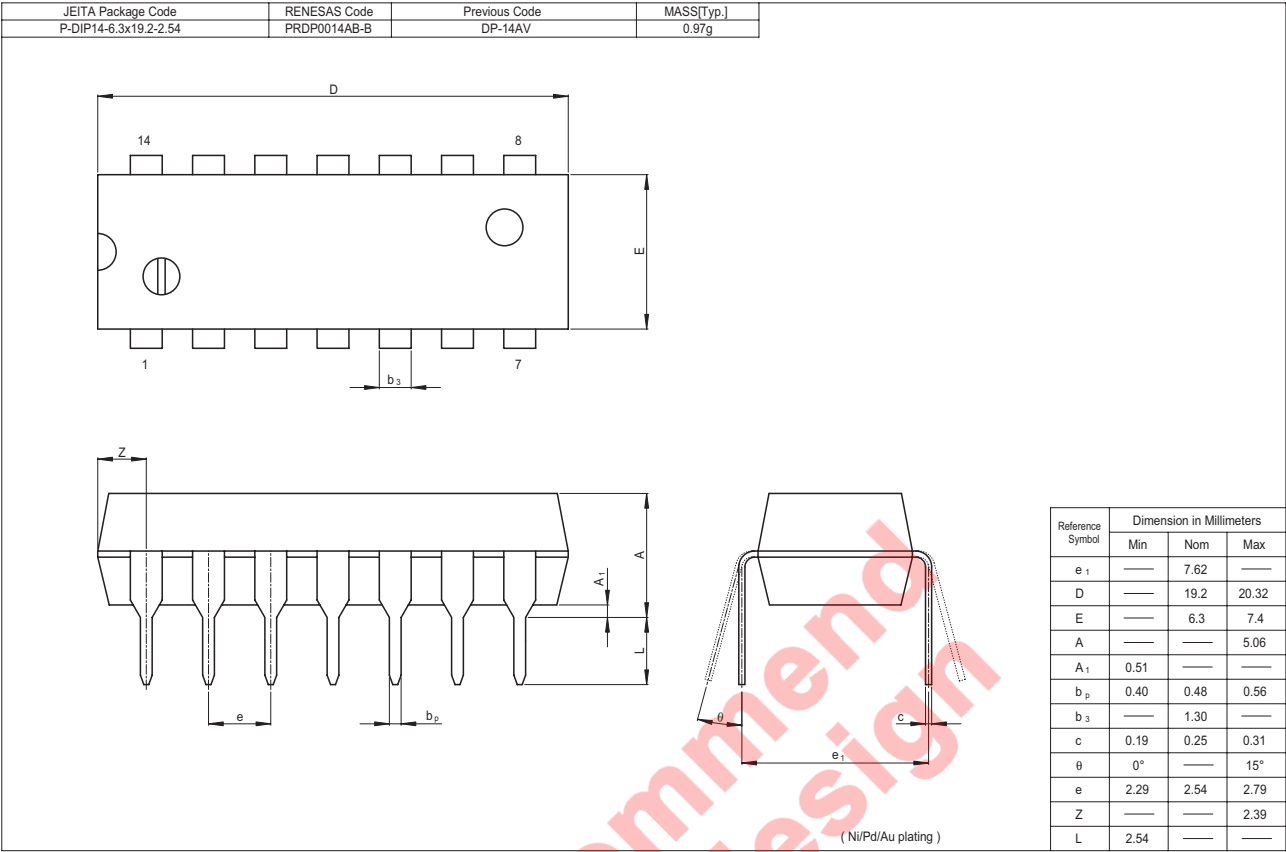
Note: Input pulse: $t_{TLH} \leq 15$ ns, $t_{THL} \leq 6$ ns, PRR = 1 MHz, duty cycle 50%

Waveforms 2



- Notes:
1. Input pulse: $t_{TLH} \leq 15 \text{ ns}$, $t_{THL} \leq 6 \text{ ns}$, $PRR = 1 \text{ MHz}$, duty cycle 50%
 2. Waveform a is an output by internal conditions like "L" except for the case where an output is disabled by output control.
 3. Waveform b is an output by internal conditions like "H" except for the case where an output is disabled by output control.

Package Dimensions



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