

HD74LS645

Octal Bus Transceivers (non-inverted 3-state outputs)

REJ03D0491-0200

Rev.2.00

Feb.18.2005

This octal bus transceivers is 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 (\bar{G}) can be used to disable the device so that the buses are effectively isolated.

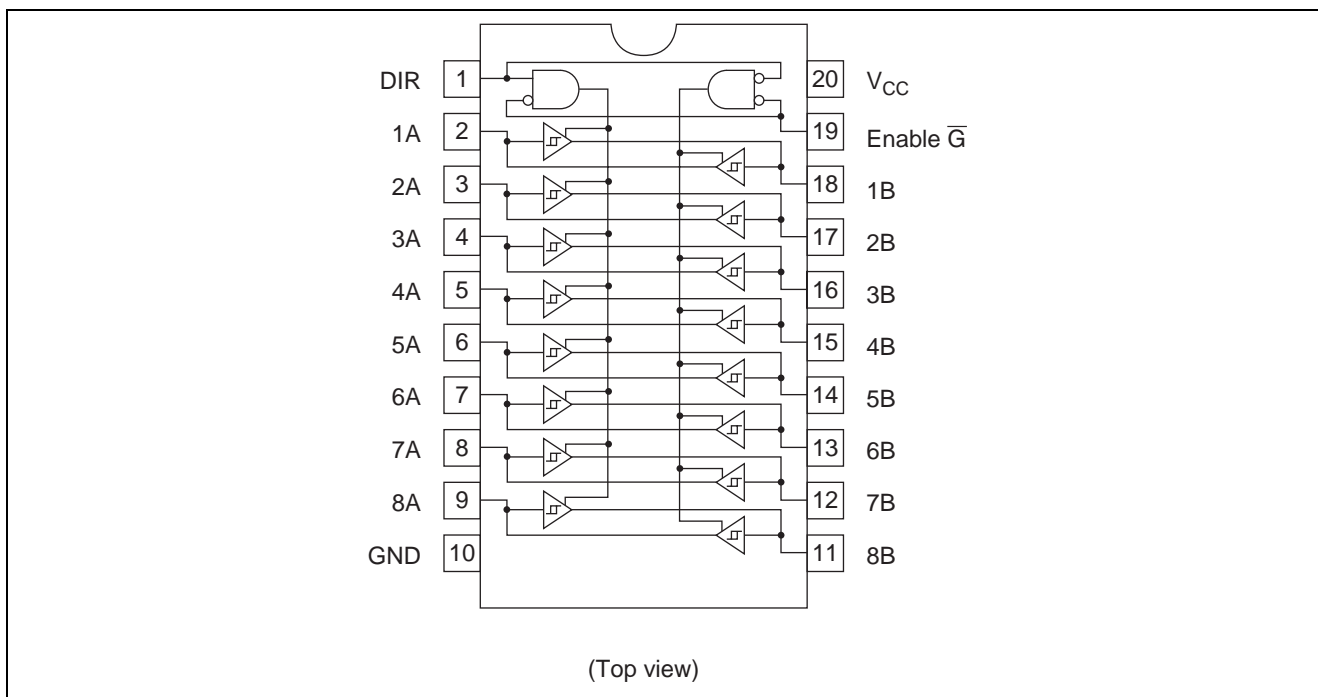
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS645P	DILP-20 pin	PRDP0020AC-B (DP-20NEV)	P	—
HD74LS645FPEL	SOP-20 pin (JEITA)	PRSP0020DD-B (FP-20DAV)	FP	EL (2,000 pcs/reel)

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

Pin Arrangement

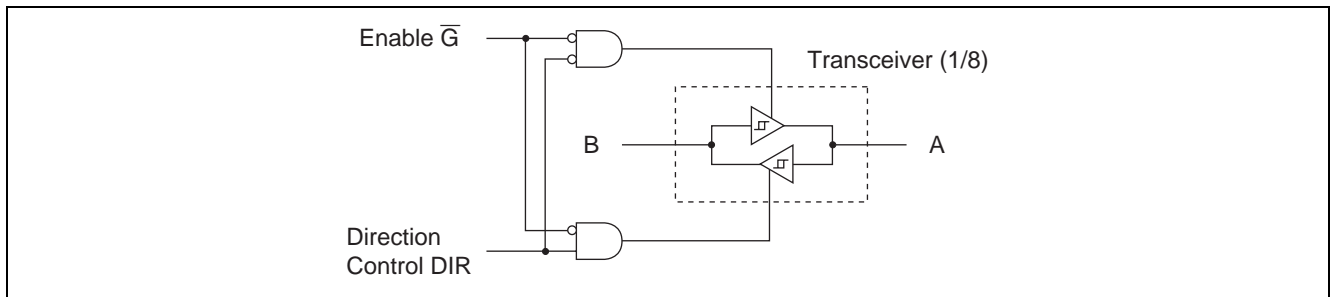


Function Table

Enable	Direction Control	Operation
\bar{G}	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

Note: H; high level, L; low level, X; irrelevant

Block Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	7	V
Input voltage	V_{IN}	7	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				
Hysteresis		V _T ⁺ – V _T [–]	0.2	—	—	V	V _{CC} = 4.75 V		
Output voltage		V _{OH}	2.4	—	—	V	I _{OH} = –3 mA	V _{CC} = 4.75 V, V _{IH} = 2 V, V _{IL} = 0.8 V	
			2	—	—		I _{OH} = –15 mA		
		V _{OL}	—	—	0.4	V	I _{OL} = 12 mA	V _{CC} = 4.75 V, V _{IH} = 2 V, V _{IL} = 0.8 V	
			—	—	0.5		I _{OL} = 24 mA		
Output current		I _{OZH}	—	—	20	μA	V _O = 2.7 V	V _{CC} = 5.25 V, G̅ input = 2 V	
		I _{OZL}	—	—	–400		V _O = 0.4 V		
Input current			I _{IH}	—	—	20	μA	V _{CC} = 5.25 V, V _I = 2.7 V	
			I _{IL}	—	—	–400	μA	V _{CC} = 5.25 V, V _I = 0.4 V	
		A or B DIR or G̅	I _I	—	—	0.1	mA	V _I = 5.5 V	V _{CC} = 5.25 V
				—	—	0.1		V _I = 7 V	
Short-circuit output current		I _{OS} ^{***}	–40	—	–225	mA	V _{CC} = 5.25 V		
Supply current**		I _{CCH}	—	48	70	mA	V _{CC} = 5.25 V, Output open		
		I _{CCL}	—	62	90				
		I _{CCZ}	—	64	95				
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** I_{CC} is measured with all outputs open.

*** Not more than one output shall be shorted at a time. the duration of the short circuit shall not exceed one second.

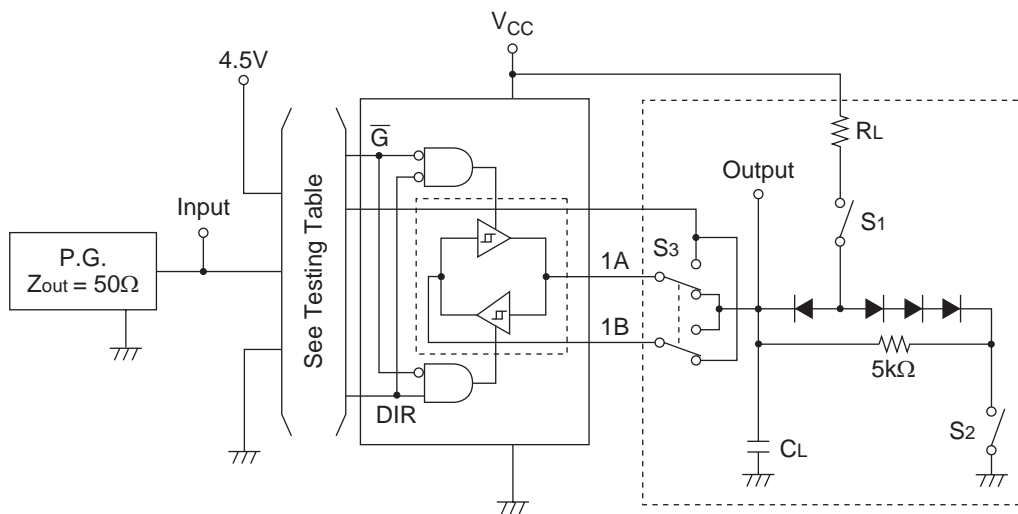
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	t _{PLH}	A	B	—	8	15	ns	C _L = 45 pF, R _L = 667 Ω
		B	A	—	8	15	ns	
	t _{PHL}	A	B	—	11	15	ns	
		B	A	—	11	15	ns	
Output enable time	t _{ZL}	G	A	—	31	40	ns	
		G	B	—	31	40	ns	
	t _{ZH}	G	A	—	26	40	ns	
		G	B	—	26	40	ns	
Output disable time	t _{LZ}	G	A	—	15	25	ns	C _L = 5 pF, R _L = 667 Ω
		G	B	—	15	25	ns	
	t _{HZ}	G	A	—	15	25	ns	
		G	B	—	15	25	ns	

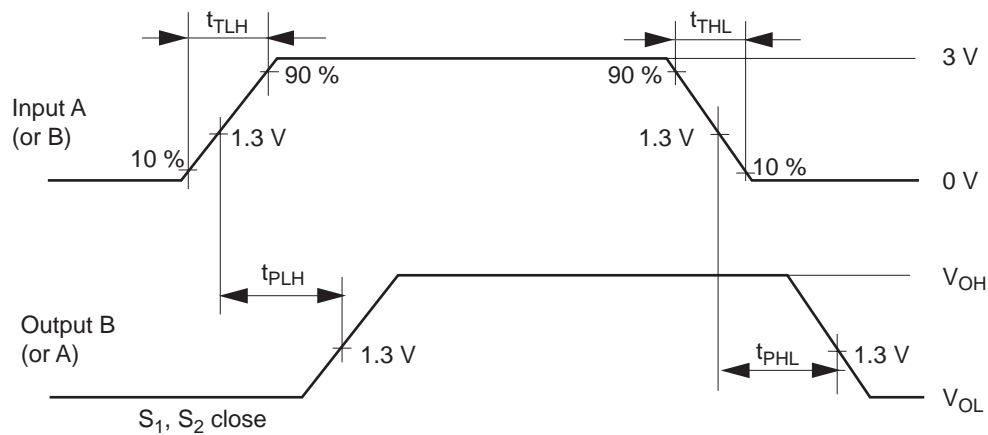
Testing Method

Test Circuit



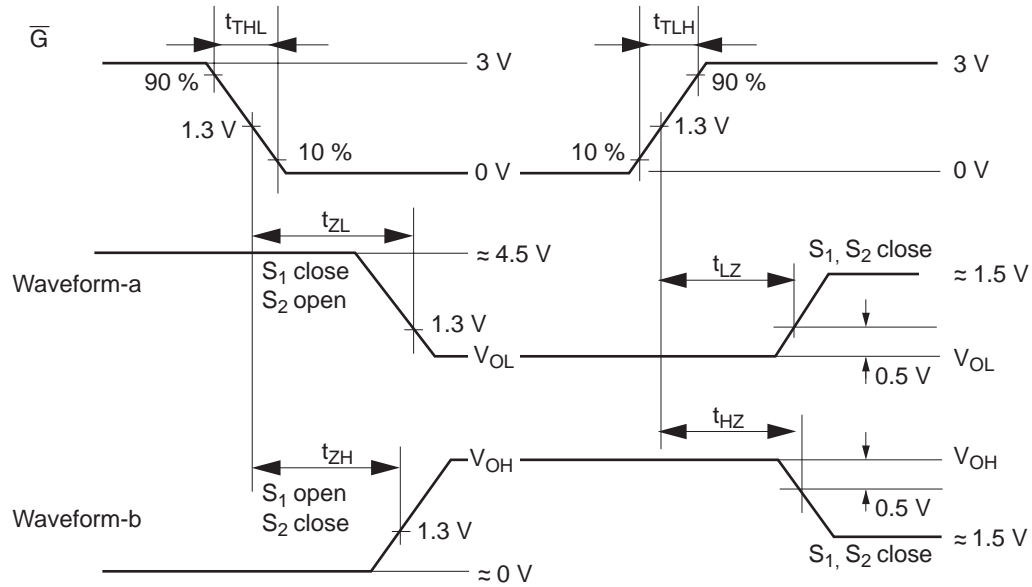
- Notes:
1. C_L includes probe and jig capacitance.
 2. 2A-2B, 3A-3B, 4A-4B, 5A-5B, 6A-6B, 7A-7B, 8A-8B, are identical to above load circuit.
 3. S_3 is a input-output switch.
 4. All diodes are 1S2074(H).

Waveforms 1



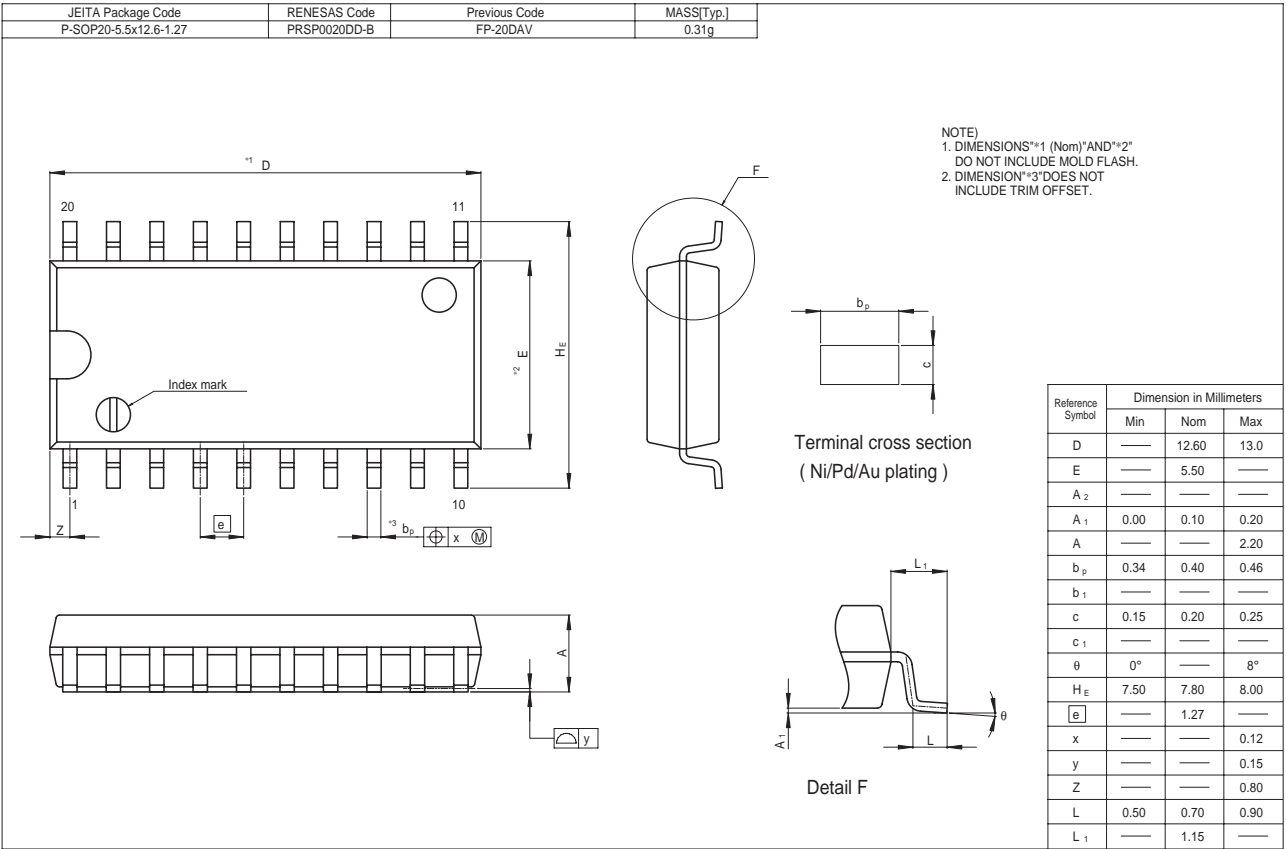
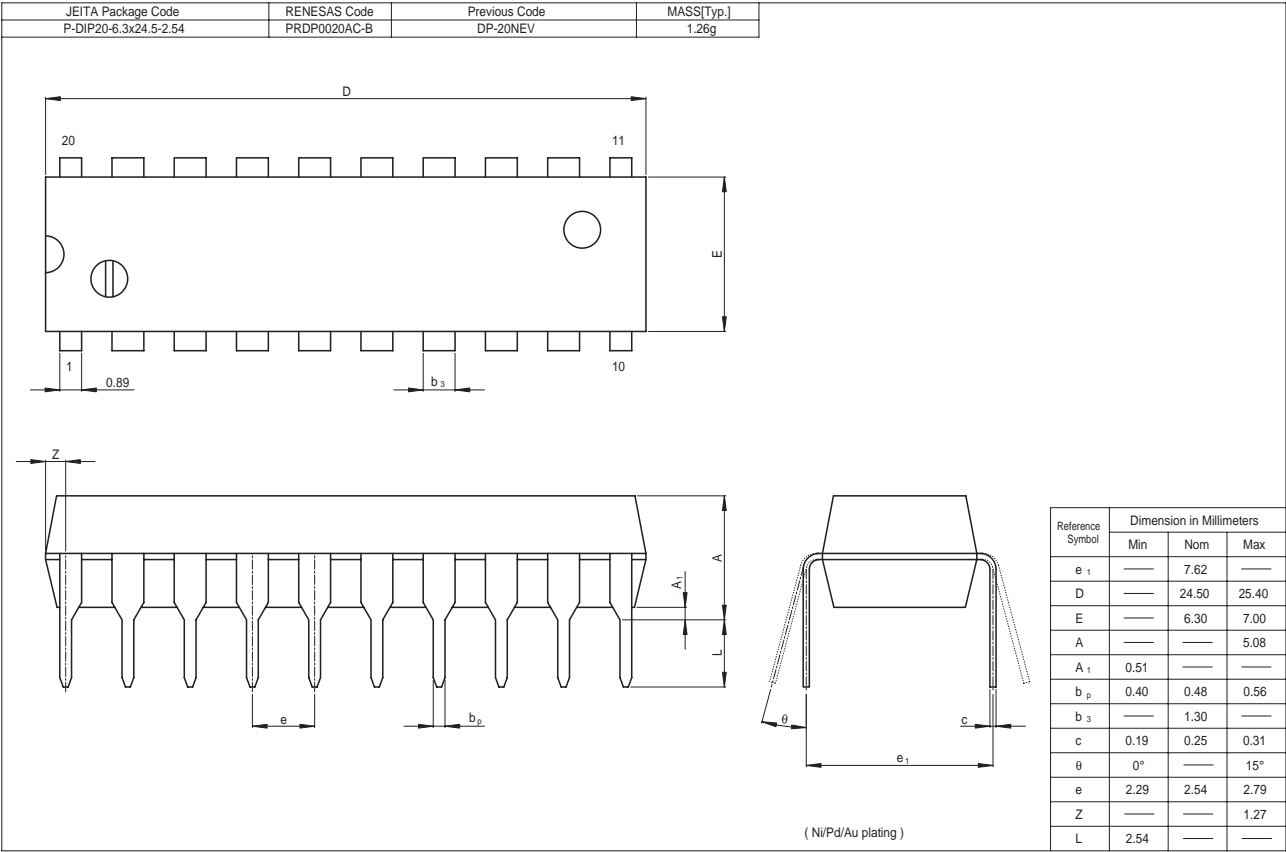
Note: Input pulse: $t_{TLH} \leq 15 \text{ ns}$, $t_{THL} \leq 6 \text{ ns}$, $\text{PRR} = 1 \text{ MHz}$, duty cycle 50%

Waveforms 2



- Notes:
1. Input pulse: $t_{TLH} \leq 15$ ns, $t_{THL} \leq 6$ ns, PRR = 1 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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