

# HD74LS640

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

REJ03D0487-0200

Rev.2.00

Feb.18.2005

This octal bus transceivers is designed for asynchronous two-way communication between data buses. The device 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.

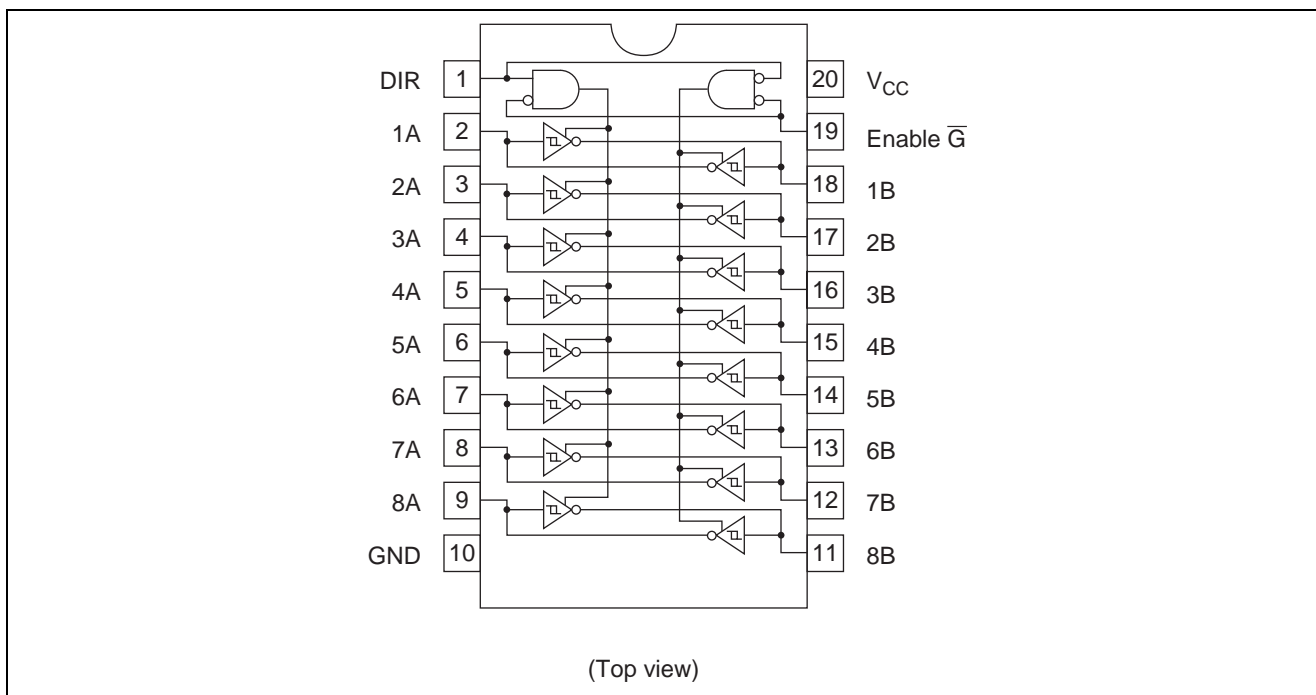
### Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS640P	DILP-20 pin	PRDP0020AC-B (DP-20NEV)	P	—
HD74LS640FPEL	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

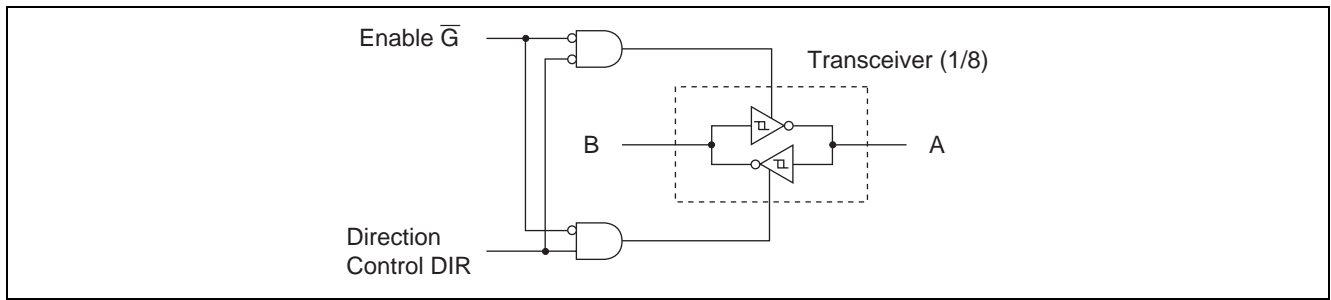


### Function Table

Enable	Direction Control	Operation
$\bar{G}$	DIR	
L	L	$\bar{B}$ data to A bus
L	H	$\bar{A}$ 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	Tstg	-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	Topr	-20	25	75	°C

## Electrical Characteristics

( $T_a = -20$  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	—	—	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	—	—	V		$I_{OH} = -15$ 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	V		$I_{OL} = 24$ mA
Output current	$I_{OZH}$	—	—	20	μA	$V_O = 2.7$ V $V_{CC} = 5.25$ V, $\bar{G}$ input = 2 V	
	$I_{OZL}$	—	—	-400	μA	$V_O = 0.4$ 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	$I_I$	—	—	0.1	mA	$V_I = 5.5$ V $V_{CC} = 5.25$ V
			DIR or $\bar{G}$	—	—	0.1	
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	mA		
	$I_{CCZ}$	—	64	95	mA		
Input clamp voltage	$V_{IK}$	—	—	-1.5	V	$V_{CC} = 4.75$ V, $I_{IN} = -18$ mA	

Notes: \*  $V_{CC} = 5$  V,  $T_a = 25$ °C

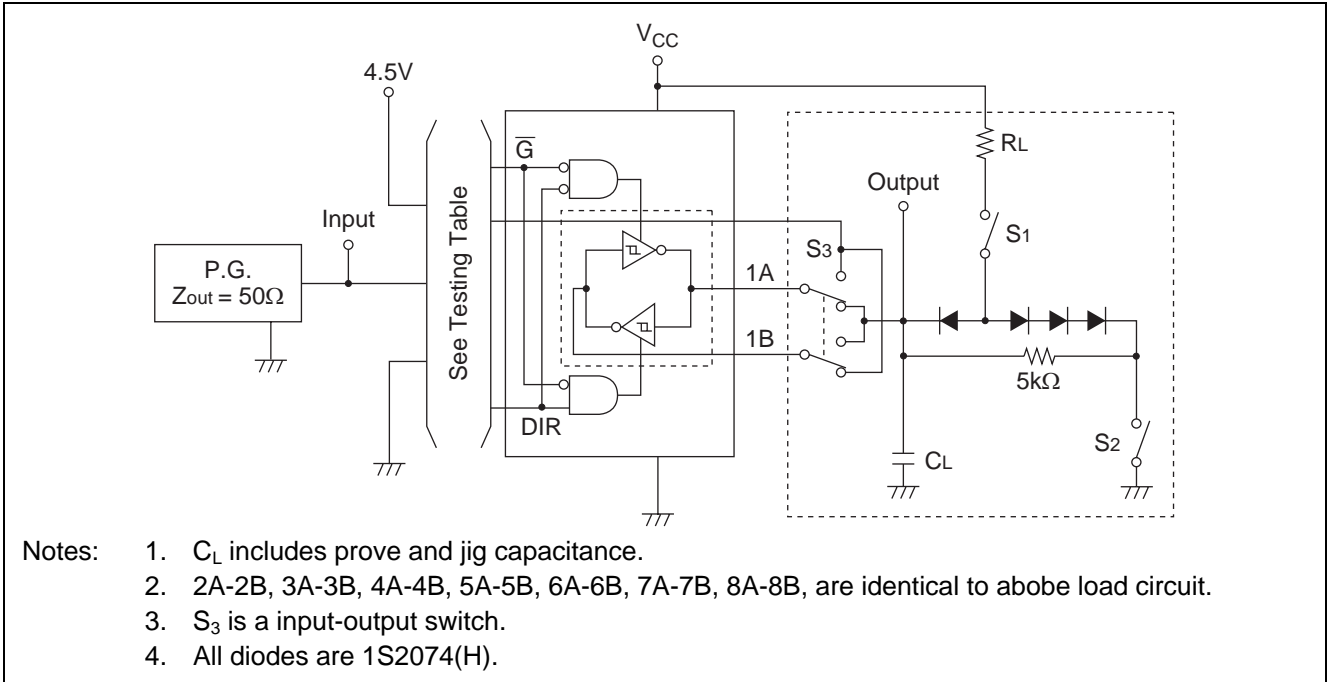
\*\* Not more than one output shall be shorted at a time. the duration of the short circuit shall not exceed one second.

## Switching Characteristics

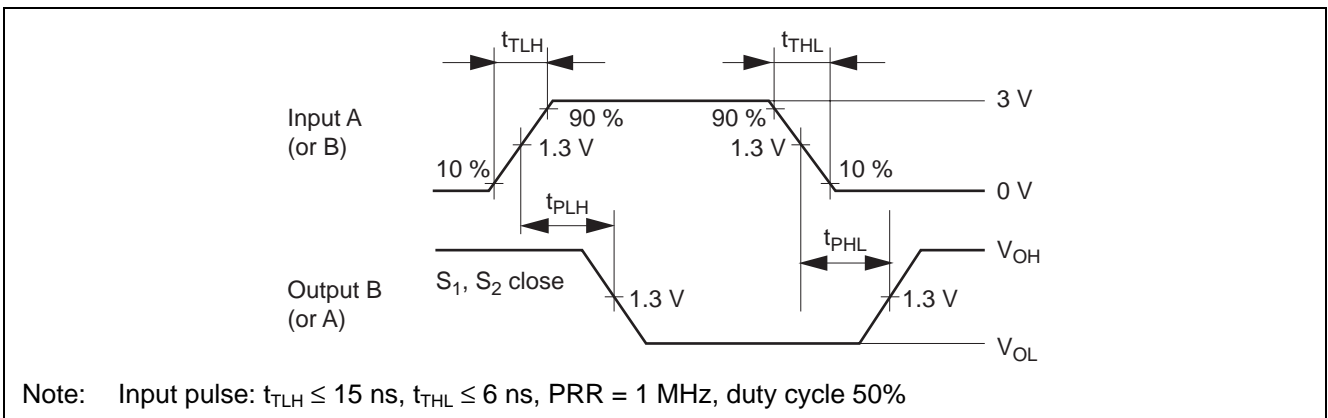
 $(V_{CC} = 5\text{ V}, T_a = 25^\circ\text{C})$ 

Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	$t_{PLH}$	A	B	—	6	10	ns	$C_L = 45\text{ pF},$ $R_L = 667\ \Omega$
		B	A	—	6	10	ns	
	$t_{PHL}$	A	B	—	8	15	ns	
		B	A	—	8	15	ns	
Output enable time	$t_{ZL}$	$\overline{G}$	A	—	31	40	ns	
		$\overline{G}$	B	—	31	40	ns	
	$t_{ZH}$	$\overline{G}$	A	—	23	40	ns	
		$\overline{G}$	B	—	23	40	ns	
Output disable time	$t_{LZ}$	$\overline{G}$	A	—	15	25	ns	$C_L = 5\text{ pF},$ $R_L = 667\ \Omega$
		$\overline{G}$	B	—	15	25	ns	
	$t_{HZ}$	$\overline{G}$	A	—	15	25	ns	
		$\overline{G}$	B	—	15	25	ns	

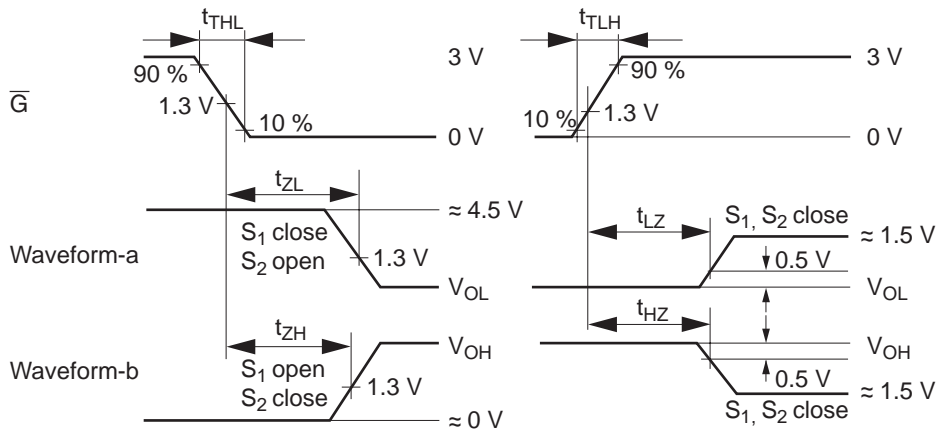
Testing Method



Waveforms 1

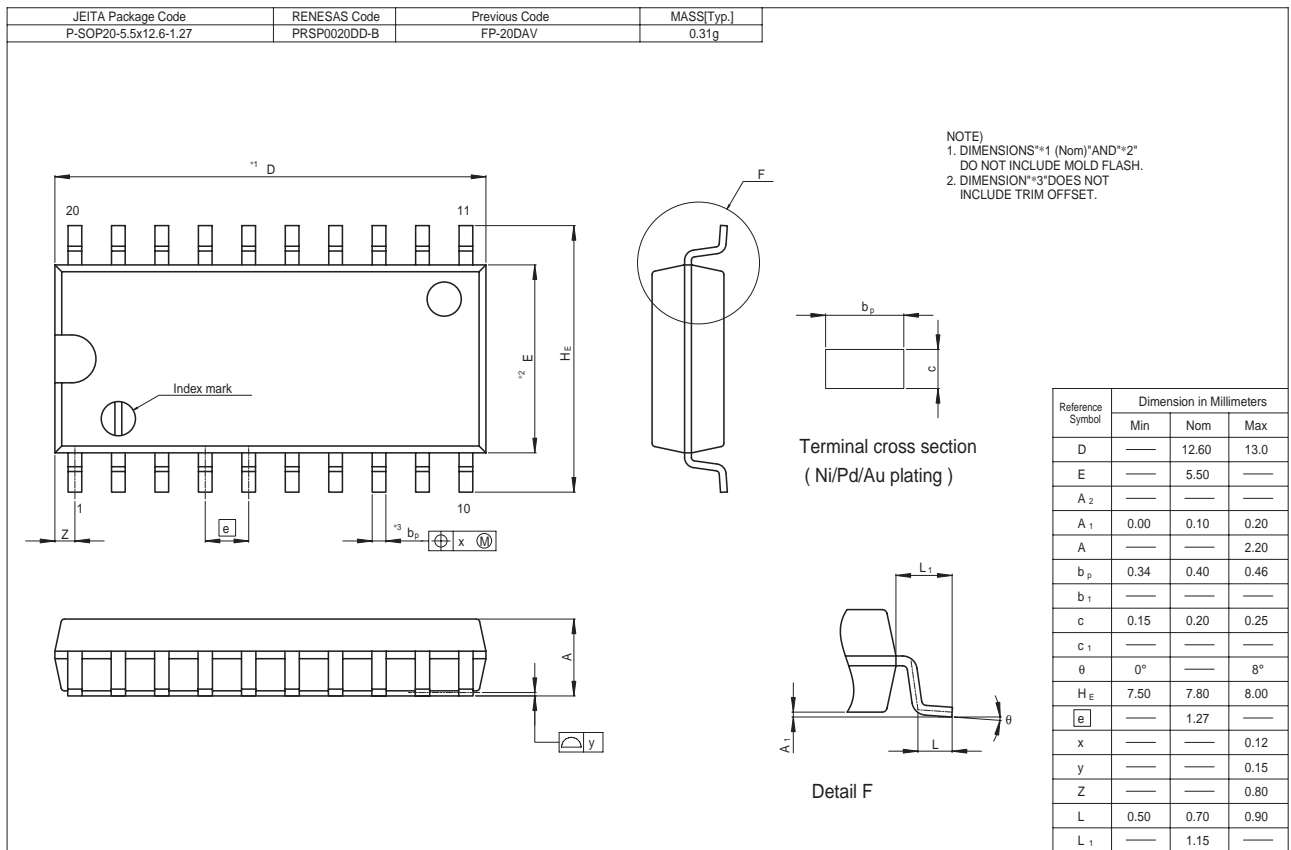
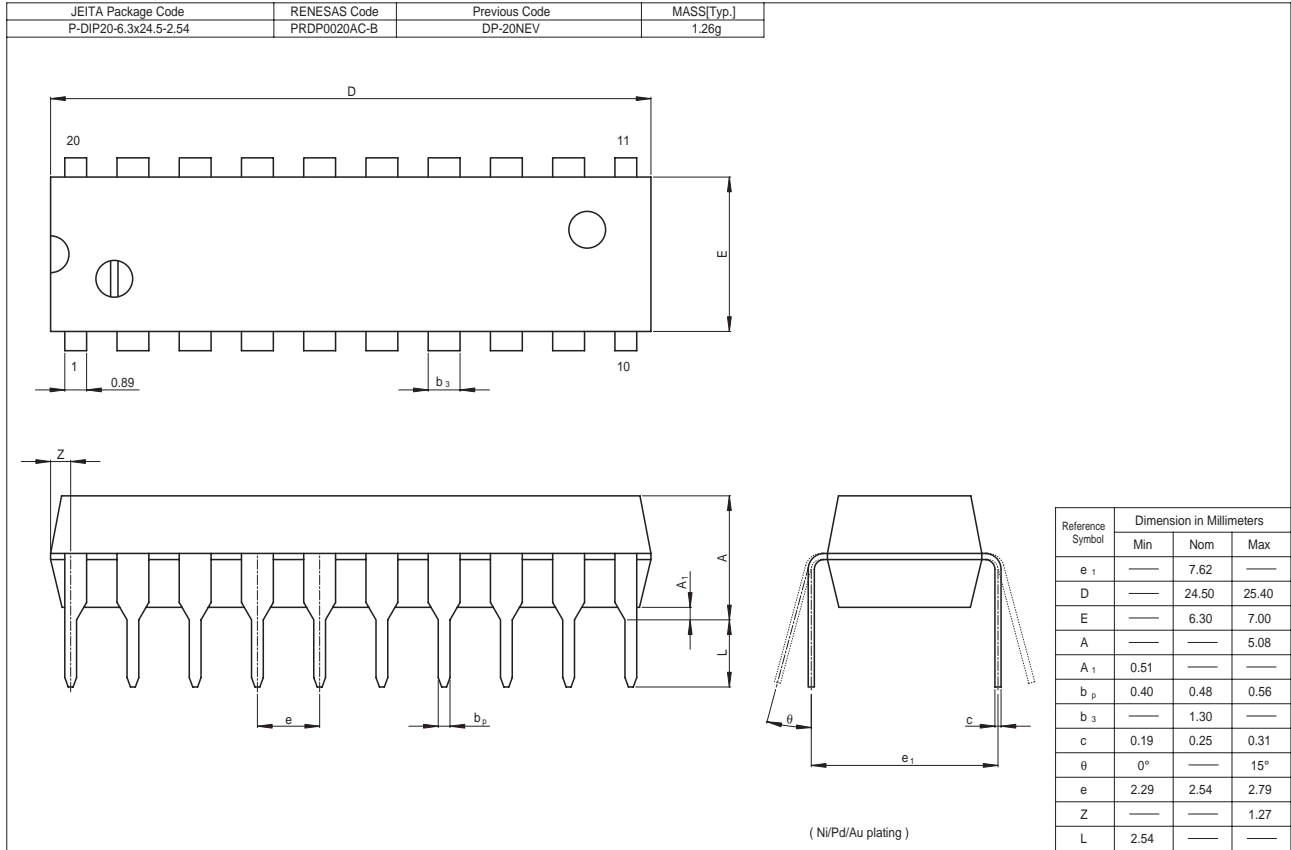


Waveforms 2



- 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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