HD74LS642

Octal Bus Transceivers (inverted open-collector outputs)

REJ03D0490–0200
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 ($\overline{G}$) can be used to disable the device so that the buses are effectively isolated.

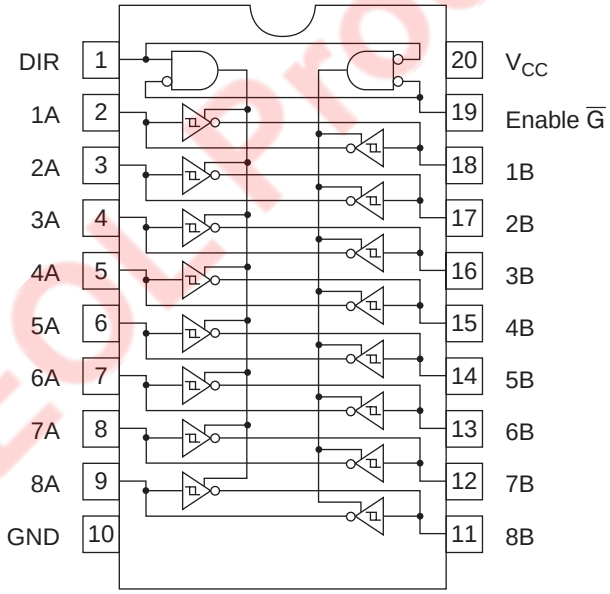
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS642P	DILP-20 pin	PRDP0020AC-B (DP-20NEV)	P	—
HD74LS642FPEL	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



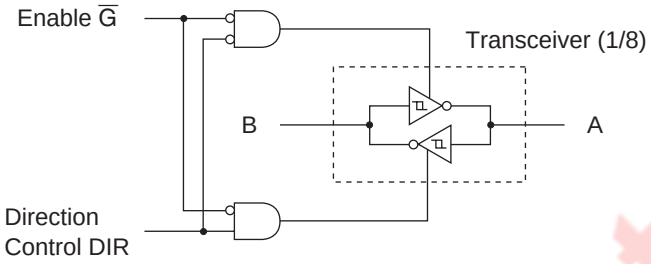
(Top view)

Function Table

Enable	Direction Control	Operation
$\overline{G}$	DIR	
L	L	$\overline{B}$ data to A bus
L	H	$\overline{A}$ 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 voltage	V_{OH}	—	—	5.5	V
Output current	I_{OL}	—	—	24	mA
Operating temperature	Topr	–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	—	—	V	V_{CC} = 4.75 V	
Output current		I_{OH}	—	—	100	µA	V_{CC} = 4.75 V, V_{IH} = 2 V, V_{IL} = 0.8 V, V_{OH} = 5.5 V	
Output voltage		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	
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 $\overline{G}$		—	—	0.1	mA	V_I = 7 V	
Supply current**		I_{CCH}	—	48	70	mA	V_{CC} = 5.25 V	
		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, Ta = 25°C

** I_{CC} is measured with all outputs open.

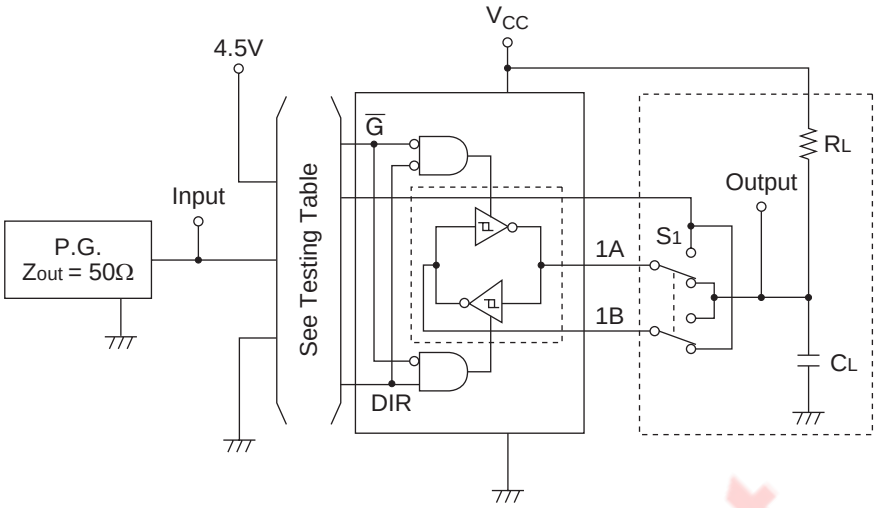
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	t_{PLH}	A	B	—	19	25	ns	C_L = 45 pF, R_L = 667 Ω
		B	A	—	19	25	ns	
	t_{PHL}	A	B	—	14	25	ns	
		B	A	—	14	25	ns	
Output enable time	t_{PLH}	$\overline{G}$	A	—	26	40	ns	
		$\overline{G}$	B	—	28	40	ns	
	t_{PHL}	$\overline{G}$	A	—	43	60	ns	
		$\overline{G}$	B	—	39	60	ns	

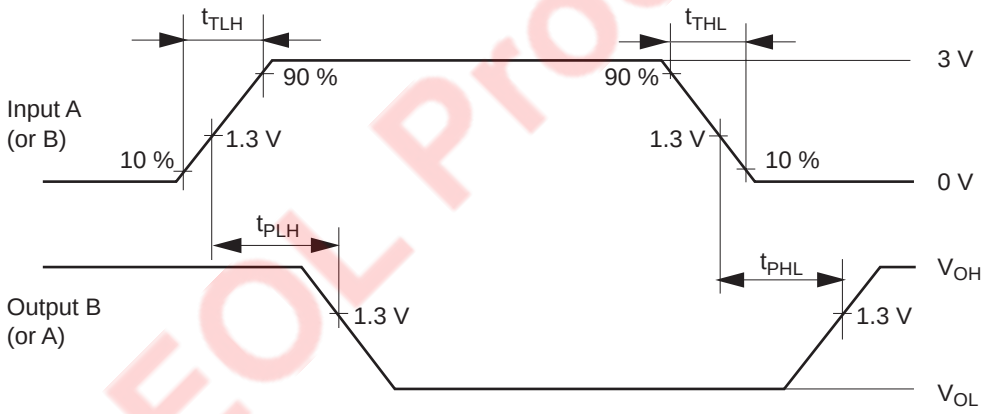
Testing Method

Test Circuit



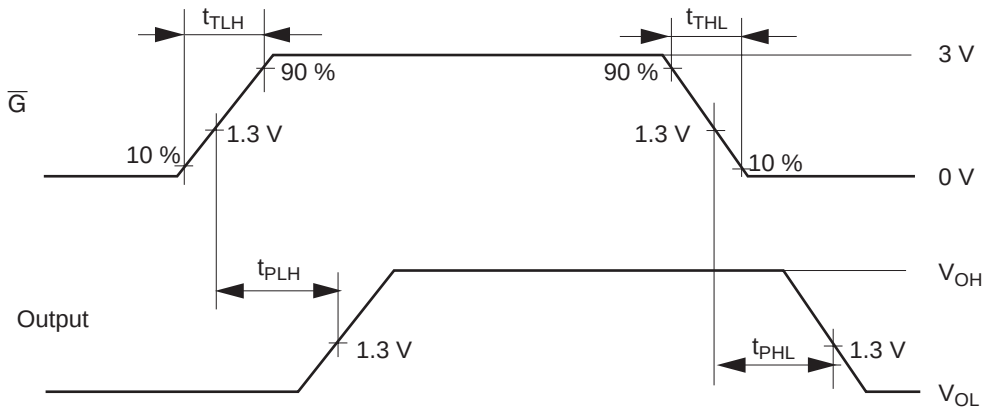
Notes:
1. 2A-2B, 3A-3B, 4A-4B, 5A-5B, 6A-6B, 7A-7B, 8A-8B, are identical to abobe load circuit.
2. C_L includes prove and jig capacitance.
3. S_1 is a input-output switch.

Waveforms 1



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

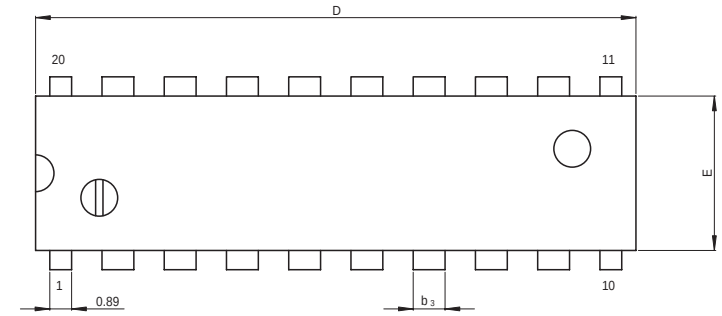
Waveforms 2

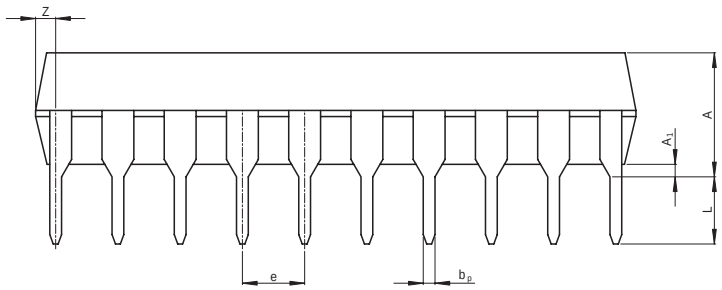


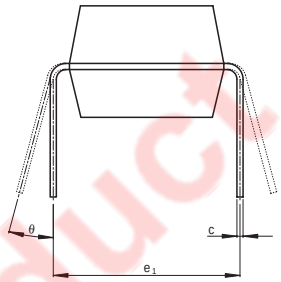
Note: Input pulse: $t_{TLH} \leq 15$ ns, $t_{THL} \leq 6$ ns, PRR = 1 MHz, duty cycle 50%

Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP20-6.3x24.5-2.54	PRDP0020AC-B	DP-20NEV	1.26g



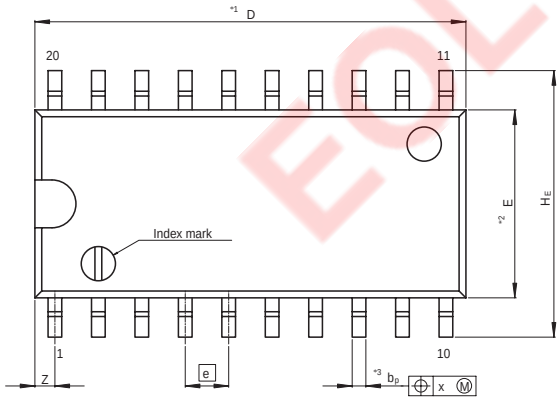


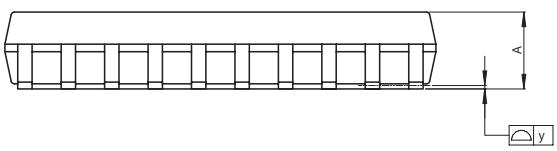


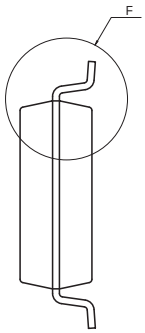
(Ni/Pd/Au plating)

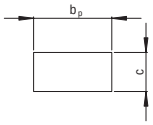
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e 1	——	7.62	——
D	——	24.50	25.40
E	——	6.30	7.00
A	——	——	5.08
A 1	0.51	——	——
b p	0.40	0.48	0.56
b 3	——	1.30	——
c	0.19	0.25	0.31
θ	0°	——	15°
e	2.29	2.54	2.79
Z	——	——	1.27
L	2.54	——	——

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP20-5.5x12.6-1.27	PRSP0020DD-B	FP-20DAV	0.31g



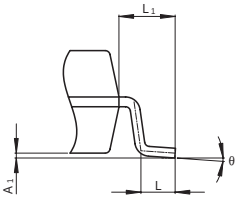






Terminal cross section
(Ni/Pd/Au plating)

NOTE)
1. DIMENSIONS"*1 (Nom)"AND"*2"
   DO NOT INCLUDE MOLD FLASH.
2. DIMENSION"*3"DOES NOT
   INCLUDE TRIM OFFSET.



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	——	12.60	13.0
E	——	5.50	——
A 2	——	——	——
A 1	0.00	0.10	0.20
A	——	——	2.20
b p	0.34	0.40	0.46
b 1	——	——	——
c	0.15	0.20	0.25
c 1	——	——	——
θ	0°	——	8°
HE	7.50	7.80	8.00
e	——	1.27	——
x	——	——	0.12
y	——	——	0.15
Z	——	——	0.80
L	0.50	0.70	0.90
L 1	——	1.15	——

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