HD74LS245

Octal Bus Transceivers (with three-state outputs)

REJ03D0464–0300
Rev.3.00
Jul.15.2005

This octal bus transceiver is designed for synchronous two-way communication between data buses. The control function implementation minimizes external timing requirements. The device allows data transmission from the A bus to the B bus or from the B bus to the A bus depending upon the logic 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.

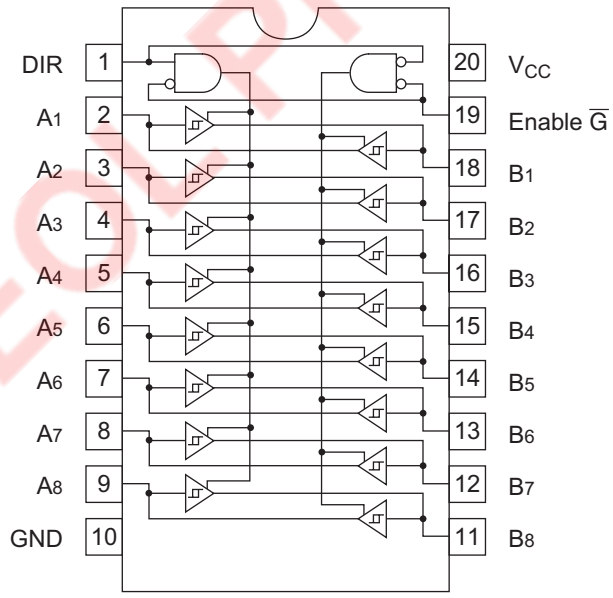
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS245P	DILP-20 pin	PRDP0020AC-B (DP-20NEV)	P	—
HD74LS245FPEL	SOP-20 pin (JEITA)	PRSP0020DD-B (FP-20DAV)	FP	EL (2,000 pcs/reel)
HD74LS245RPEL	SOP-20 pin (JEDEC)	PRSP0020DC-A (FP-20DBV)	RP	EL (1,000 pcs/reel)

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

Pin Arrangement



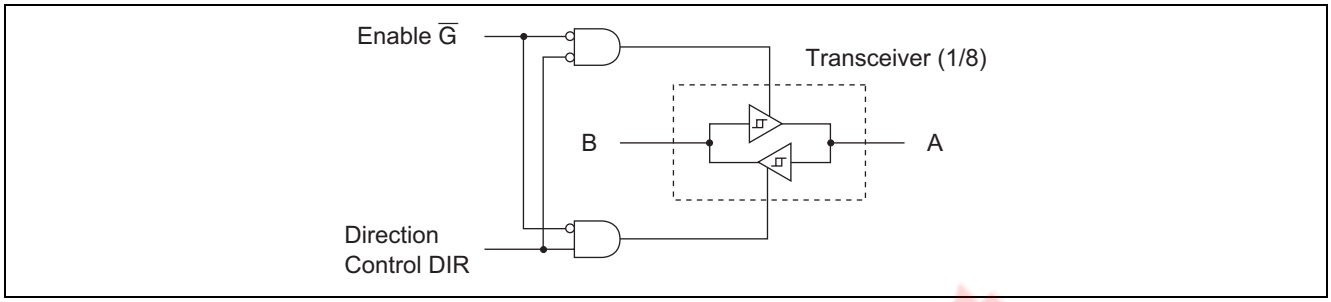
(Top view)

Function Table

Enable $\overline{G}$	Direction Control DIR	Operation
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	DIR, $\overline{G}$	V_{IN}	7	V
	A, B	V_{IN}	5.5	V
Power dissipation		P_T	400	mW
Storage temperature		Tstg	–65 to +150	°C
Operating temperature		Topr	–20 to +75	°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

(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	0.4	—	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	
Off-state output current	I_{OZH}	—	—	20	µA	V_O = 2.7 V	V_{CC} = 5.25 V, $\overline{G}$ = 2 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	
	I_{IL}	—	—	–0.2	mA	V_{CC} = 5.25 V, V_I = 0.4 V	
A or B	I_I	—	—	0.1	mA	V_{CC} = 5.25 V, V_I = 5.5 V	
DIR or $\overline{G}$		—	—	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}	—	48	70	mA	V_{CC} = 5.25 V	
	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

** With all outputs open, I_{CC} is measured with transceivers enabled in one direction only, or with all transceivers disabled.

Switching Characteristics

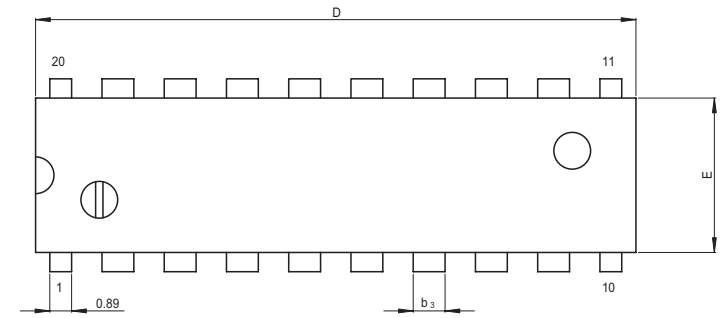
(V_{CC} = 5 V, Ta = 25°C)

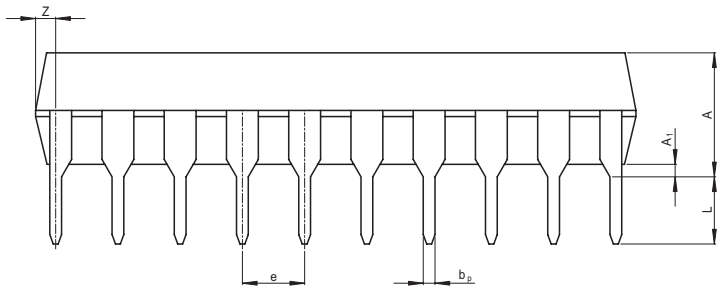
Item	Symbol	min.	typ.	max.	Unit	Condition
Propagation delay time	t_{PLH}	—	8	15	ns	C_L = 45 pF, R_L = 667 Ω
	t_{PHL}	—	11	15		
Output enable time	t_{ZL}	—	27	40		
	t_{ZH}	—	25	40		
Output disable time	t_{LZ}	—	15	25		C_L = 5 pF, R_L = 667 Ω
	t_{HZ}	—	15	25		

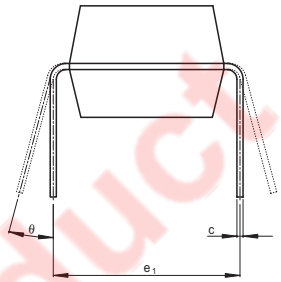
Note: Refer to Test Circuit and Waveform of the Common Item "TTL Common Matter (Document No.: REJ27D0005-0100)".

Package Dimensions

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



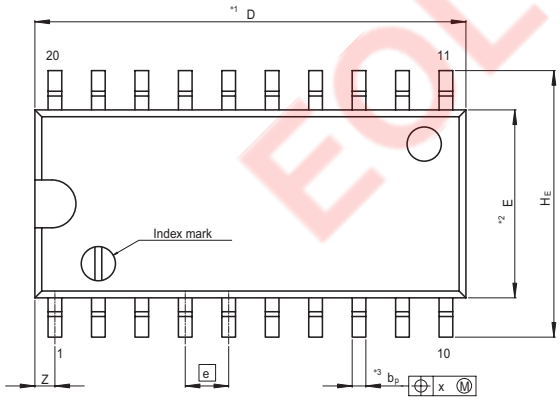


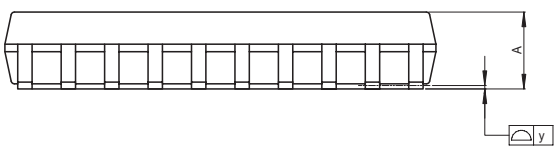


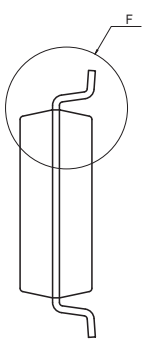
(Ni/Pd/Au plating)

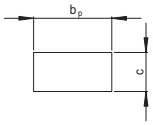
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e 1	——	7.62	——
D	——	24.50	25.40
E	——	6.30	7.00
A	——	——	5.08
A 1	0.51	——	——
b p	0.40	0.48	0.56
b 3	——	1.30	——
c	0.19	0.25	0.31
θ	0°	——	15°
e	2.29	2.54	2.79
Z	——	——	1.27
L	2.54	——	——

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



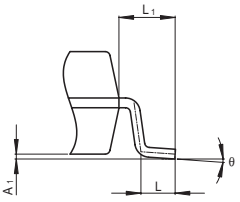






Terminal cross section
(Ni/Pd/Au plating)

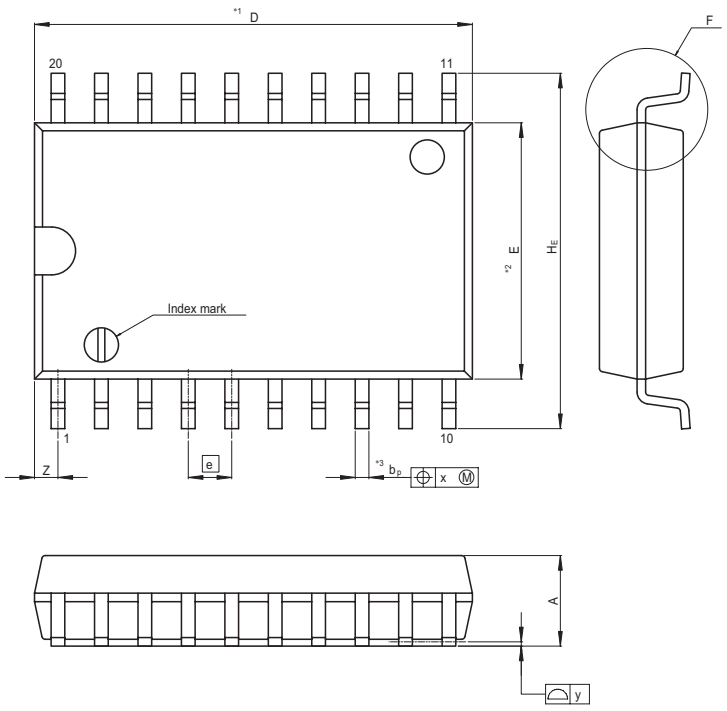
NOTE)
1. DIMENSIONS"*1 (Nom)"AND"*2"
DO NOT INCLUDE MOLD FLASH.
2. DIMENSION"*3"DOES NOT
INCLUDE TRIM OFFSET.



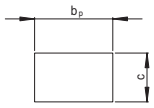
Detail F

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°
H E	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	——

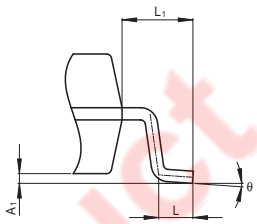
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP20-7.5x12.8-1.27	PRSP0020DC-A	FP-20DBV	0.52g



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



Terminal cross section
(Ni/Pd/Au plating)



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	——	12.80	13.2
E	——	7.50	——
A_2	——	——	——
A_1	0.10	0.20	0.30
A	——	——	2.65
b_p	0.34	0.40	0.46
b_1	——	——	——
c	0.20	0.25	0.30
c_1	——	——	——
θ	0°	——	8°
H_E	10.00	10.40	10.65
e	——	1.27	——
x	——	——	0.12
y	——	——	0.15
Z	——	——	0.935
L	0.40	0.70	1.27
L_1	——	1.45	——

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