

RD74HC245A

R07DS0047EJ0100

Rev.1.00

Jul 20, 2010

Octal Bus Transceivers (with 3-state outputs)

Description

Each device has an active low enable input $\overline{G}$ and a direction control input, DIR. When DIR is high, data flows from the A inputs to the B outputs. When DIR is low, data flows from the B inputs to the A outputs. The RD74HC245A transfers true data from one bus to the other. This device does not have schmitt trigger inputs.

Features

- High Speed Operation: $t_{pd} = 8 \text{ ns typ (} C_L = 50 \text{ pF)}$
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 2 \text{ to } 6 \text{ V}$
- Low Input Current: $1 \mu\text{A max}$
- Low Quiescent Supply Current: $I_{CC} \text{ (static)} = 4 \mu\text{A max (} T_a = 25^\circ\text{C)}$
- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)	Surface Treatment
RD74HC245APT0	DILP-20 pin	PRDP0020AC-B (DP-20NEV)	P	—	0 (Ni/Pd/Au)
RD74HC245AFPH0	SOP-20 pin (JEITA)	PRSP0020DD-B (FP-20DAV)	FP	H (2,000 pcs/reel)	0 (Ni/Pd/Au)
RD74HC245ARPH0	SOP-20 pin (JEDEC)	PRSP0020DC-A (FP-20DBV)	RP	H (1,000 pcs/reel)	0 (Ni/Pd/Au)

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

Function Table

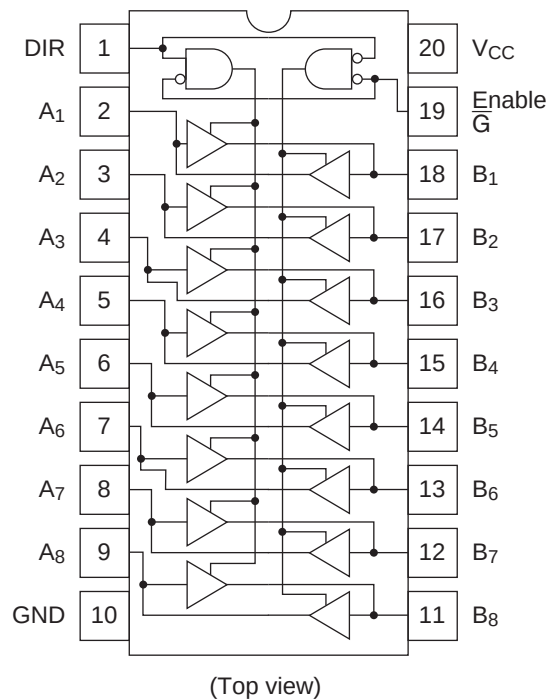
Enable G	Direction Control DIR	Operation
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

H : high level

L : low level

X : irrelevant

Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Conditions
Supply voltage range	V_{CC}	-0.5 to 7.0	V	
Input / Output voltage	V_{IN}, V_{OUT}	-0.5 to $V_{CC} + 0.5$	V	
Input / Output diode current	I_{IK}, I_{OK}	± 20	mA	
Output current	I_O	± 35	mA	
V_{CC} , GND current	I_{CC} or I_{GND}	± 75	mA	
Power dissipation	P_T	1375	mW	DIP
		835	mW	SOP
		757	mW	TSSOP
Storage temperature	T_{stg}	-65 to +150	$^{\circ}\text{C}$	

Note: The absolute maximum ratings are values, which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	V_{CC}	2 to 6	V	
Input / Output voltage	V_{IN}, V_{OUT}	0 to V_{CC}	V	
Operating temperature	T_a	-40 to 85	$^{\circ}\text{C}$	
Input rise / fall time ^{*1}	t_r, t_f	0 to 1000	ns	$V_{CC} = 2.0 \text{ V}$
		0 to 500		$V_{CC} = 4.5 \text{ V}$
		0 to 400		$V_{CC} = 6.0 \text{ V}$

Notes: 1. This item guarantees maximum limit when one input switches.

Waveform: Refer to test circuit of switching characteristics.

Electrical Characteristics

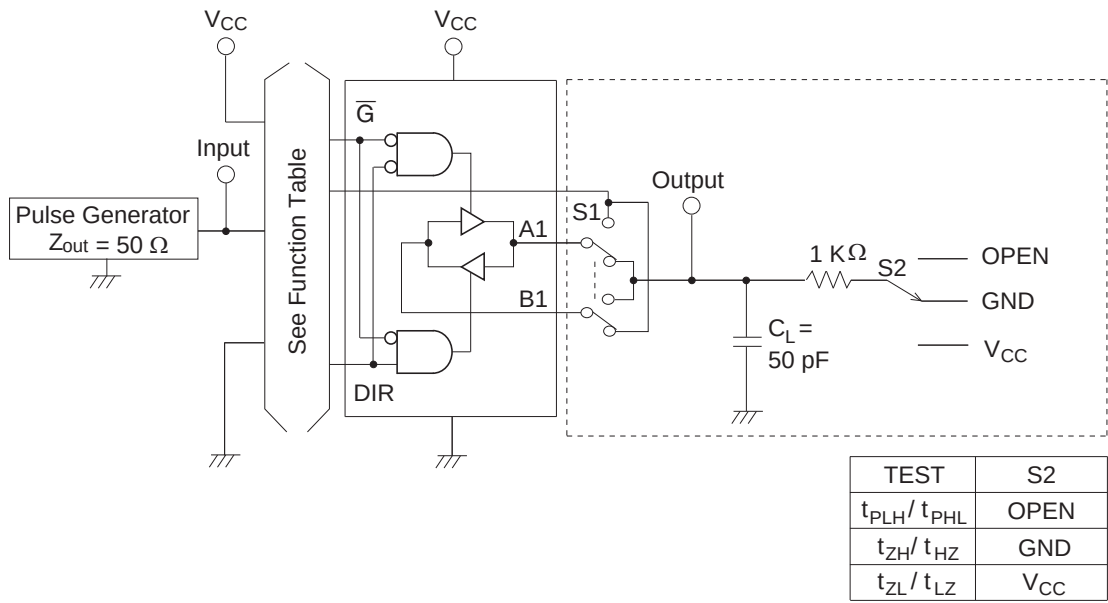
Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V _{IL}	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output voltage	V _{OH}	2.0	1.9	2.0	—	1.9	—	V	Vin = V _{IH} or V _{IL}	I _{OH} = -20 µA
		4.5	4.4	4.5	—	4.4	—			I _{OH} = -6 mA
		6.0	5.9	6.0	—	5.9	—			I _{OH} = -7.8 mA
		4.5	4.18	—	—	4.13	—			
		6.0	5.68	—	—	5.63	—			
		6.0	—	—	—	—	—			
	V _{OL}	2.0	—	0.0	0.1	—	0.1	V	Vin = V _{IH} or V _{IL}	I _{OL} = 20 µA
		4.5	—	0.0	0.1	—	0.1			I _{OL} = 6 mA
		6.0	—	0.0	0.1	—	0.1			I _{OL} = 7.8 mA
		4.5	—	—	0.26	—	0.33			
		6.0	—	—	0.26	—	0.33			
		6.0	—	—	—	—	—			
Off-state output current	I _{OZ}	6.0	—	—	±0.5	—	±5.0	µA	Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND	
Input current	I _{in}	6.0	—	—	±0.1	—	±1.0	µA	Vin = V _{CC} or GND	
Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	µA	Vin = V _{CC} or GND, Iout = 0 µA	

Switching Characteristics

(C_L = 50 pF, Input t_r = t_f = 6 ns)

Item	Symbol	V _{CC} (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Propagation delay time	t _{PLH}	2.0	—	—	90	—	115	ns		
		4.5	—	8	18	—	23			
		6.0	—	—	15	—	20			
	t _{PHL}	2.0	—	—	90	—	115	ns		
		4.5	—	8	18	—	23			
		6.0	—	—	15	—	20			
Output enable time	t _{ZL}	2.0	—	—	150	—	190	ns		
		4.5	—	16	30	—	38			
		6.0	—	—	26	—	32			
	t _{ZH}	2.0	—	—	150	—	190	ns		
		4.5	—	12	30	—	38			
		6.0	—	—	26	—	32			
Output disable time	t _{LZ}	2.0	—	—	150	—	190	ns		
		4.5	—	17	30	—	38			
		6.0	—	—	26	—	32			
	t _{HZ}	2.0	—	—	150	—	190	ns		
		4.5	—	18	30	—	38			
		6.0	—	—	26	—	32			
Output rise/fall time	t _{TLH} t _{THL}	2.0	—	—	60	—	75	ns		
		4.5	—	4	12	—	15			
		6.0	—	—	10	—	13			
Input capacitance	C _{in}	—	—	5	10	—	10	pF		

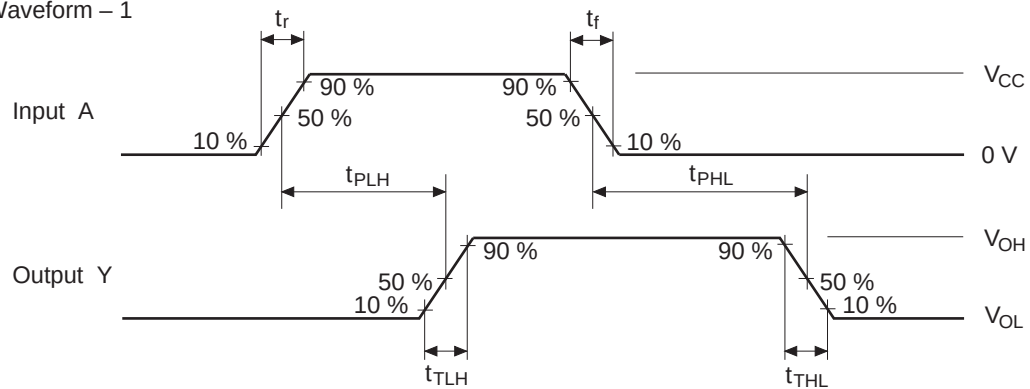
Test Circuit



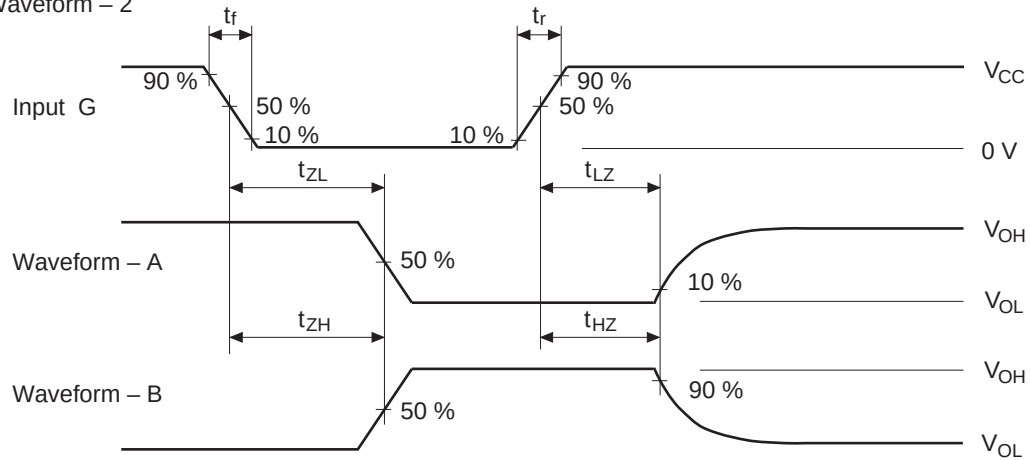
Note : 1. C_L includes probe and jig capacitance.
2. A2–B2, A3–B3, A4–B4, A5–B5, A6–B6, A7–B7, A8–B8 are identical to above load circuit.
3. S1 is a input / output switch.

Waveforms

• Waveform – 1

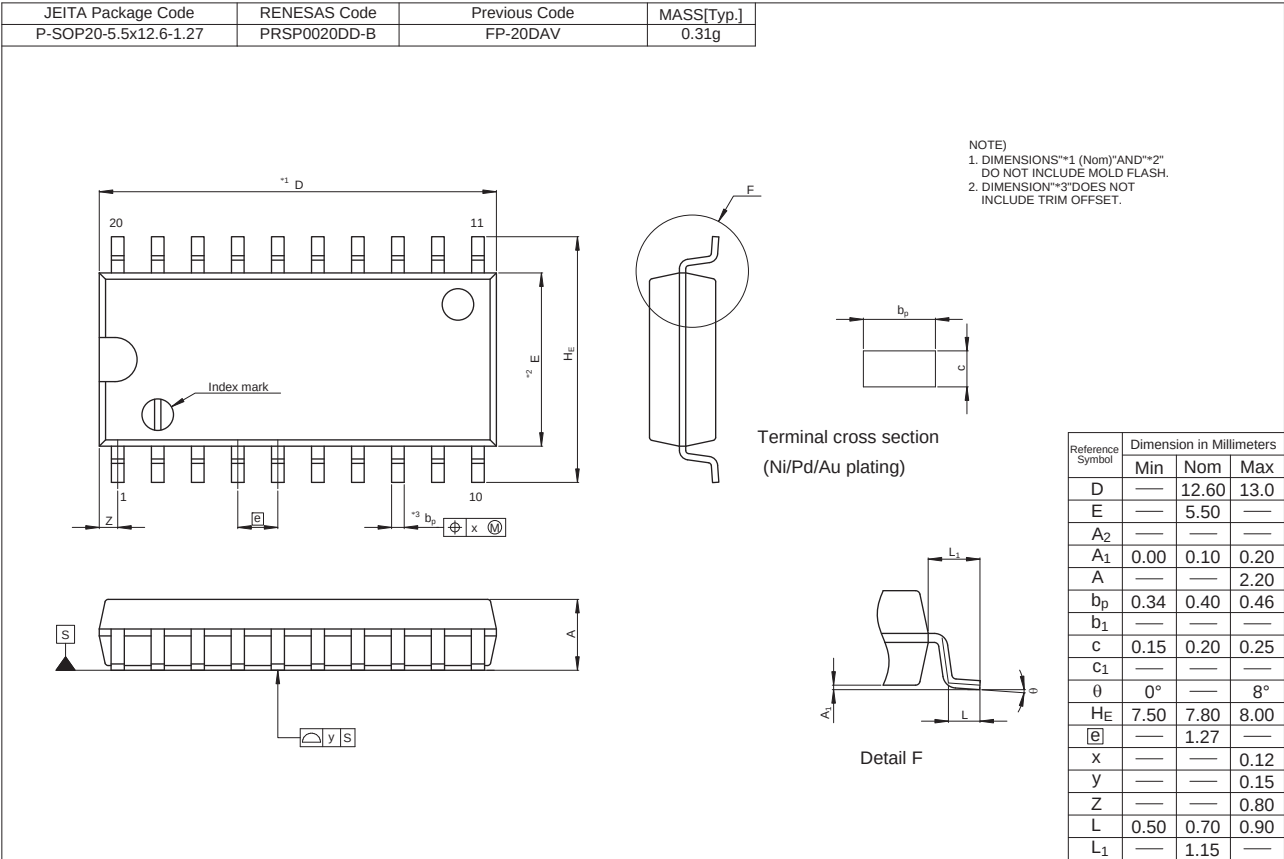
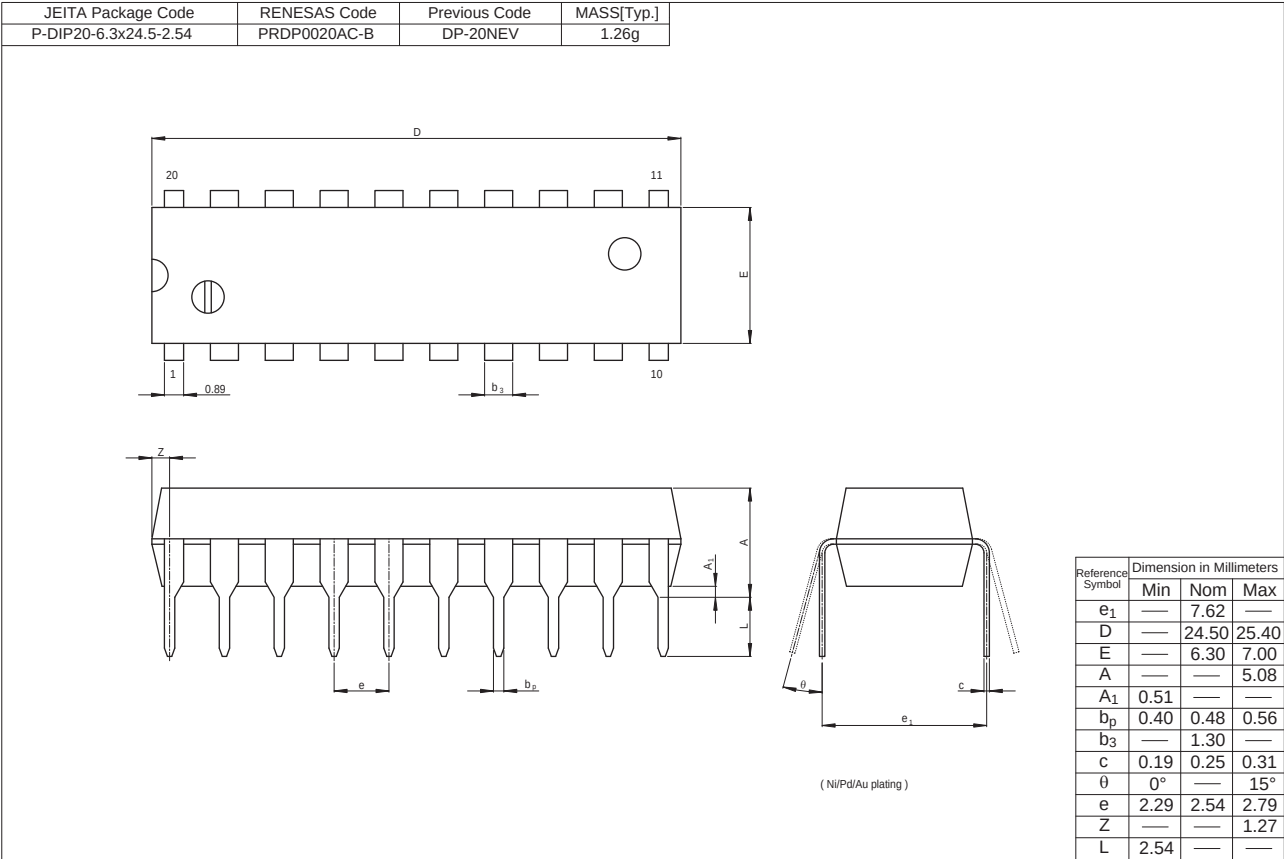


• Waveform – 2



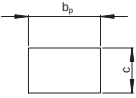
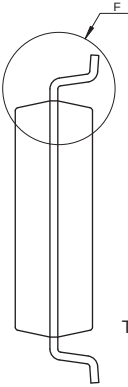
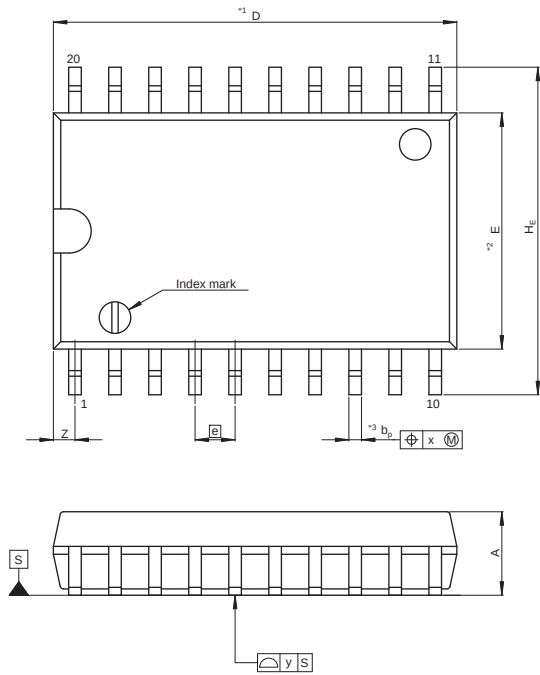
- Notes :
1. Input waveform : $PRR \leq 1 \text{ MHz}$, duty cycle 50%, $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$
 2. Waveform– A is for an output with internal conditions such that the output is low except when disabled by the output control.
 3. Waveform– B is for an output with internal conditions such that the output is high except when disabled by the output control.
 4. The output are measured one at a time with one transition per measurement.

Package Dimensions

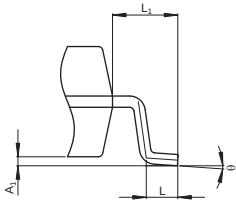


RD74HC245A

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.



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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