

# 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

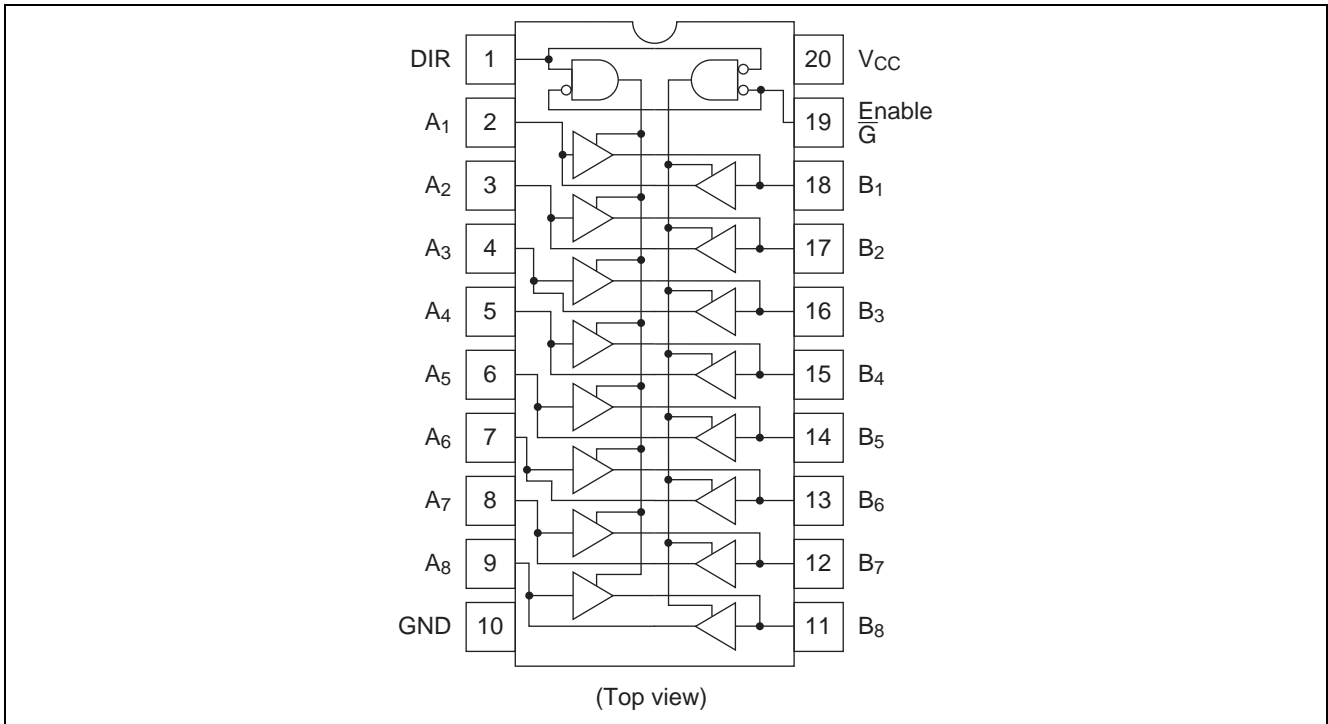
Enable G	Direction Control DIR	Operation
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

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	$I_{IK}, I_{OK}$	$\pm 20$	mA	
Output current	$I_O$	$\pm 35$	mA	
$V_{CC}$ , GND current	$I_{CC}$ or $I_{GND}$	$\pm 75$	mA	
Power dissipation	$P_T$	1375	mW	DIP
		835	mW	SOP
		757	mW	TSSOP
Storage temperature	$T_{stg}$	-65 to +150	$^{\circ}C$	

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	$^{\circ}C$	
Input rise / fall time <sup>*1</sup>	$t_r, t_f$	0 to 1000	ns	$V_{CC} = 2.0$ V
		0 to 500		$V_{CC} = 4.5$ V
		0 to 400		$V_{CC} = 6.0$ V

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

Waveform: Refer to test circuit of switching characteristics.

## Electrical Characteristics

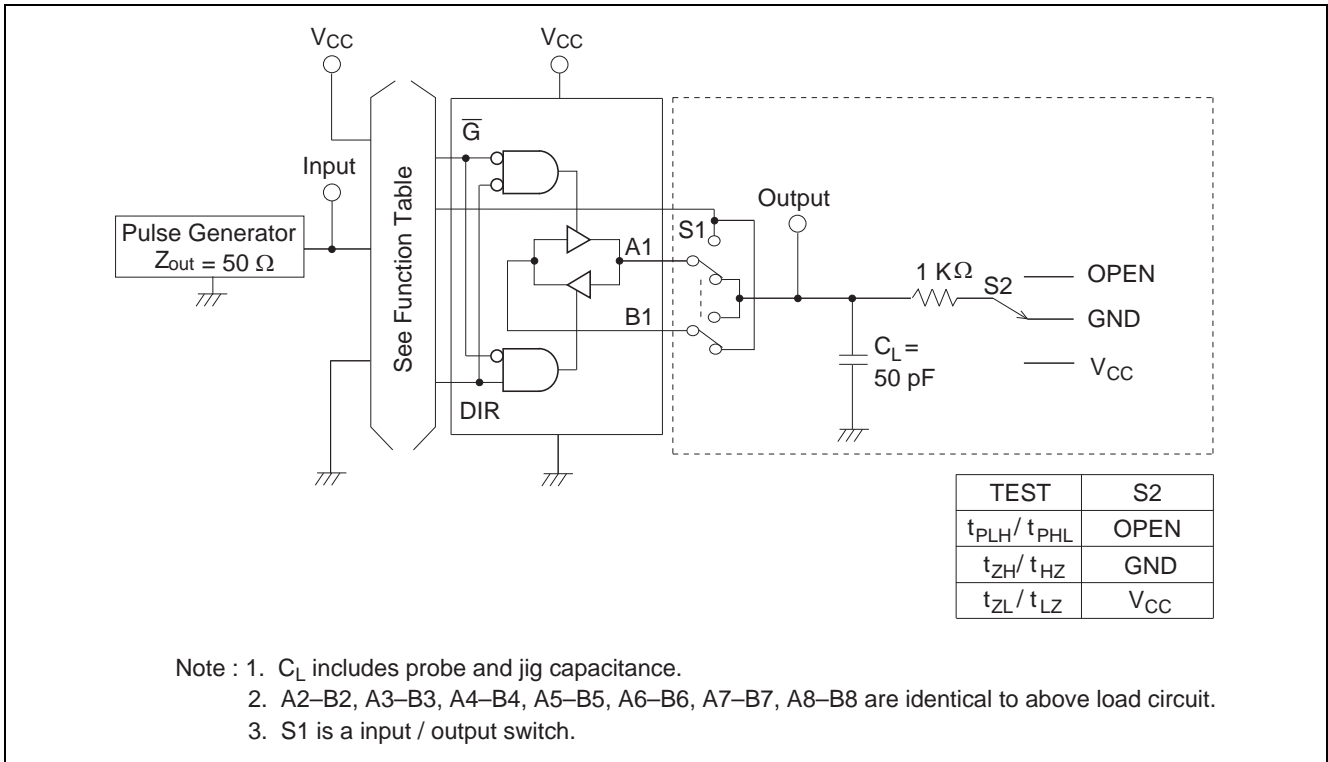
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V <sub>IH</sub>	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V <sub>IL</sub>	2.0	—	—	0.5	—	0.5	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Output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

## Switching Characteristics

(C<sub>L</sub> = 50 pF, Input t<sub>r</sub> = t<sub>f</sub> = 6 ns)

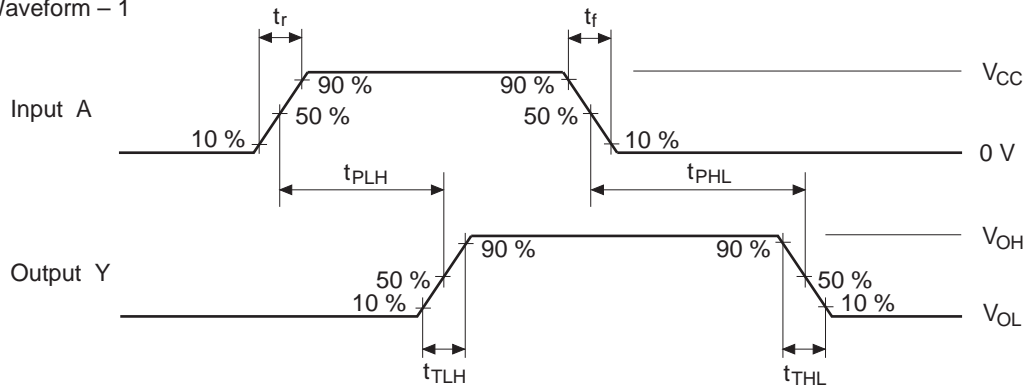
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Propagation delay time	t <sub>PLH</sub>	2.0	—	—	90	—	115	ns		
		4.5	—	8	18	—	23			
		6.0	—	—	15	—	20			
	t <sub>PHL</sub>	2.0	—	—	90	—	115	ns		
		4.5	—	8	18	—	23			
		6.0	—	—	15	—	20			
Output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

Test Circuit

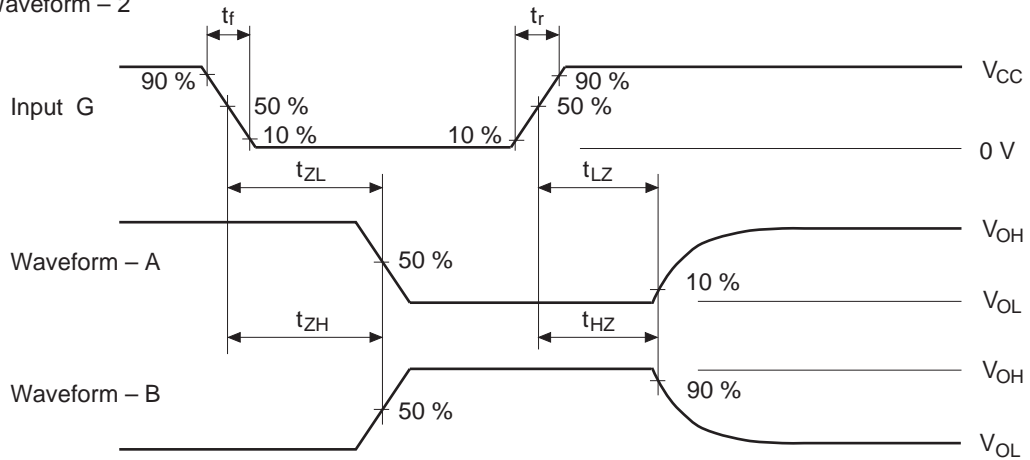


## Waveforms

## • Waveform – 1

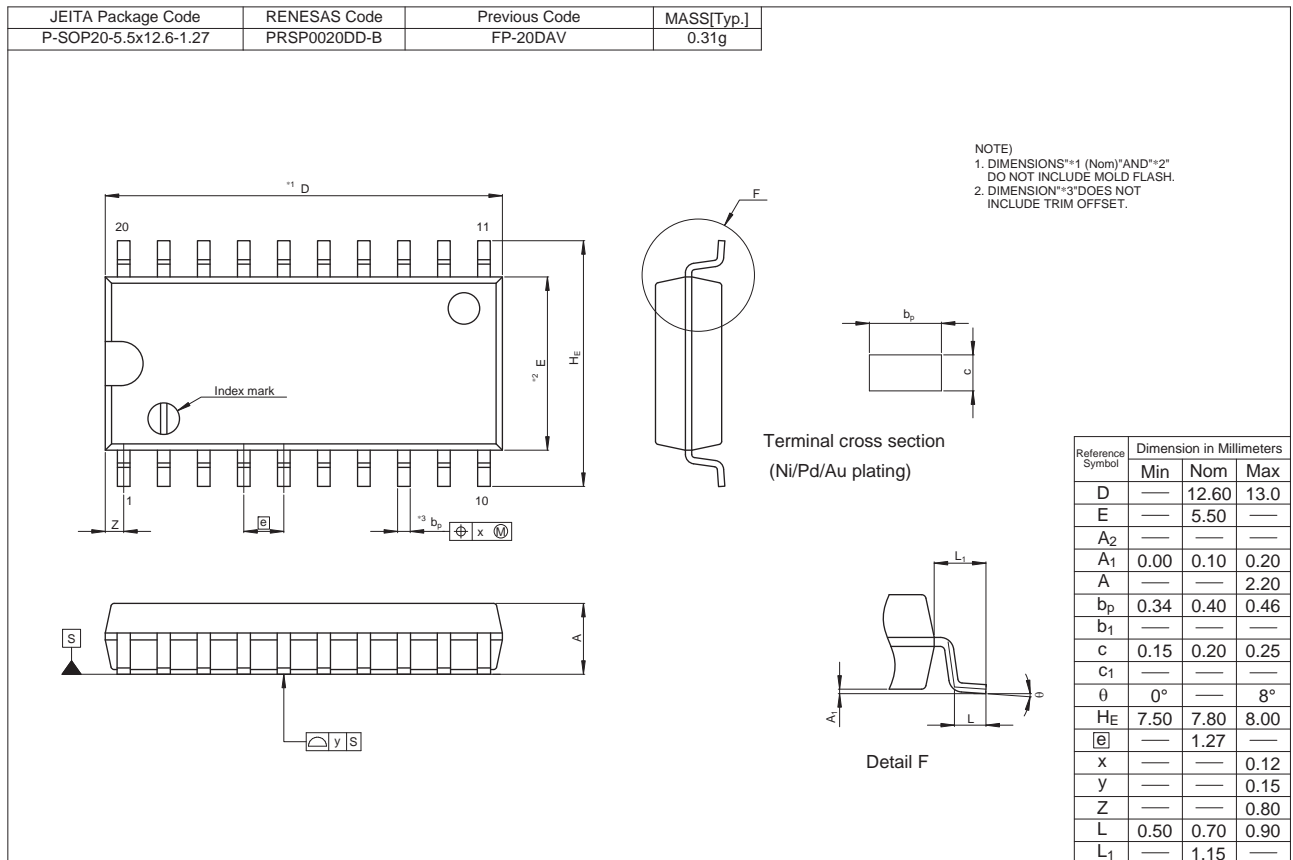
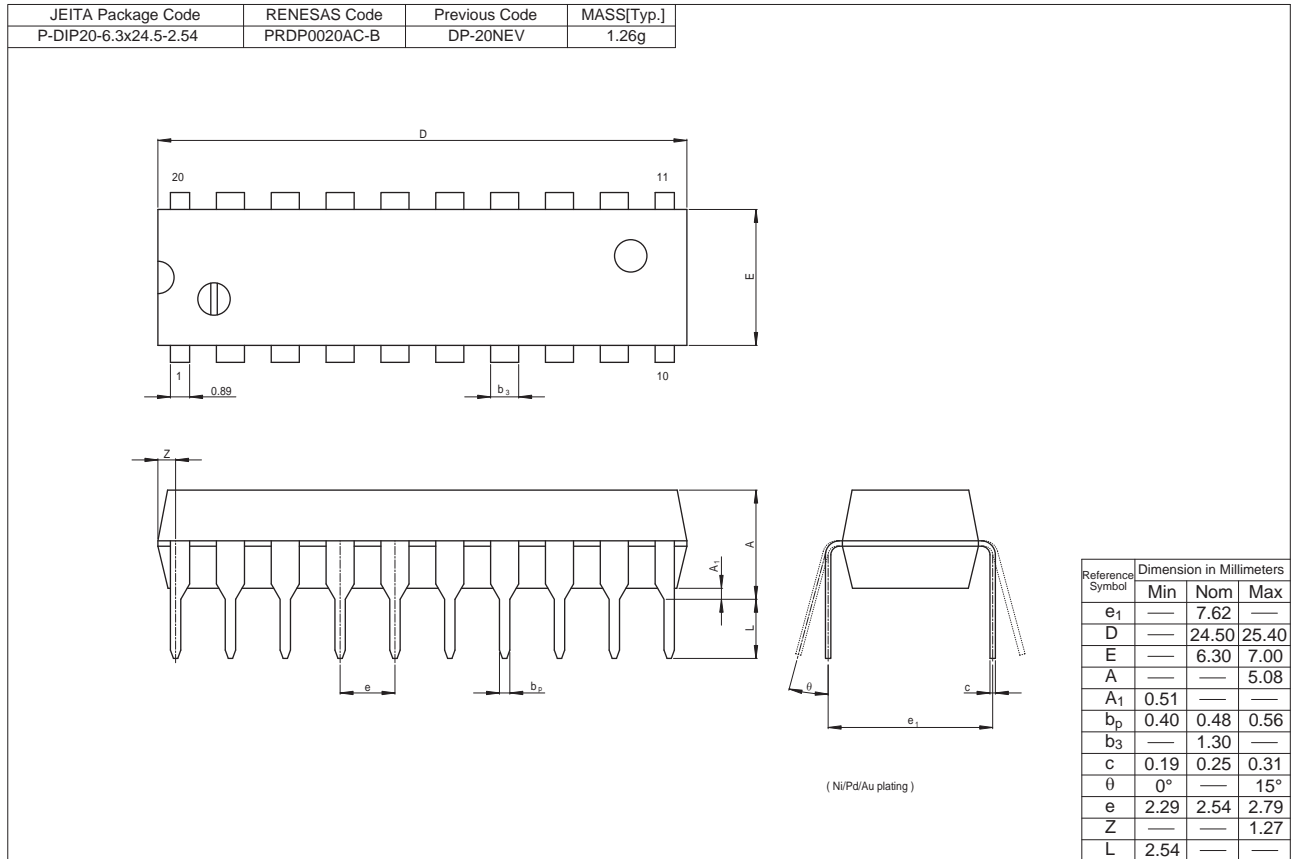


## • Waveform – 2



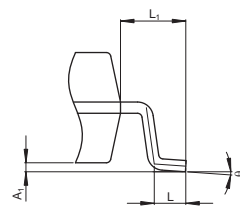
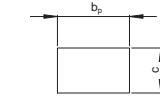
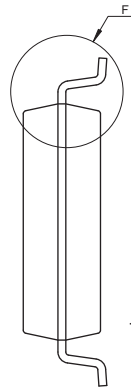
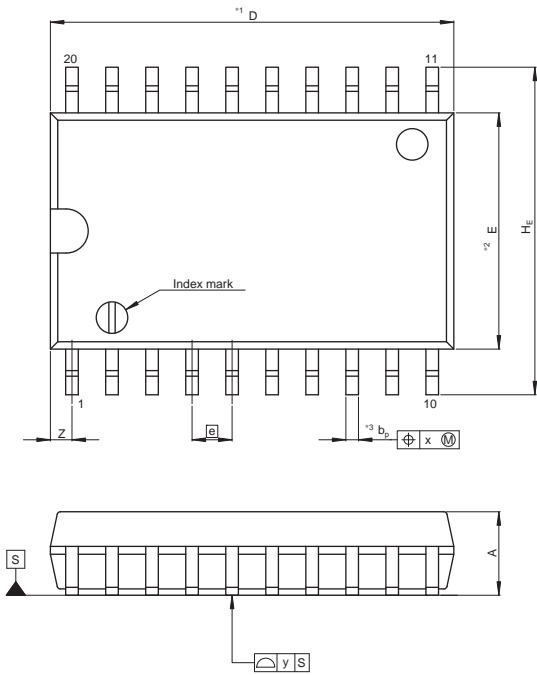
- Notes :
1. Input waveform : PRR  $\leq$  1 MHz, duty cycle 50%,  $t_r \leq$  6 ns,  $t_f \leq$  6 ns
  2. Waveform– A is for an output with internal conditions such that the output is low except when disabled by the output control.
  3. Waveform– B is for an output with internal conditions such that 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.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	12.80	13.2
E	—	7.50	—
A <sub>2</sub>	—	—	—
A <sub>1</sub>	0.10	0.20	0.30
A	—	—	2.65
b <sub>p</sub>	0.34	0.40	0.46
b <sub>1</sub>	—	—	—
c	0.20	0.25	0.30
c <sub>1</sub>	—	—	—
θ	0°	—	8°
H <sub>E</sub>	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 <sub>1</sub>	—	1.45	—

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