

HD74HCT125, HD74HCT126

Quad. Bus Buffer Gates (with 3-state outputs)

REJ03D0657-0200
 (Previous ADE-205-545)
 Rev.2.00
 Mar 30, 2006

Description

The HD74HCT125, HD74HCT126 require the 3-state control input C to be taken high to put the output into the high impedance condition, whereas the HD74HCT125, HD74HCT126 requires the control input to be low to put the output into high impedance.

Features

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation: t_{pd} (A to Y) = 12 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 4.5$ to 5.5 V
- Low Input Current: $1 \mu\text{A}$ max
- Low Quiescent Supply Current: I_{CC} (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)
HD74HCT125P	DILP-14 pin	PRDP0014AB-B (DP-14AV)	P	—
HD74HCT125FPEL HD74HCT126FPEL	SOP-14 pin (JEITA)	PRSP0014DF-B (FP-14DAV)	FP	EL (2,000 pcs/reel)
HD74HCT125TELL HD74HCT126TELL	TSSOP-14 pin	PTSP0014JA-B (TTP-14DV)	T	ELL (2,000 pcs/reel)

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

Function Table

Inputs			Output	
C		A	Y	
HCT125	HCT126		HCT125	HCT126
H	L	X	Z	Z
L	H	L	L	L
L	H	H	H	H

H : High level

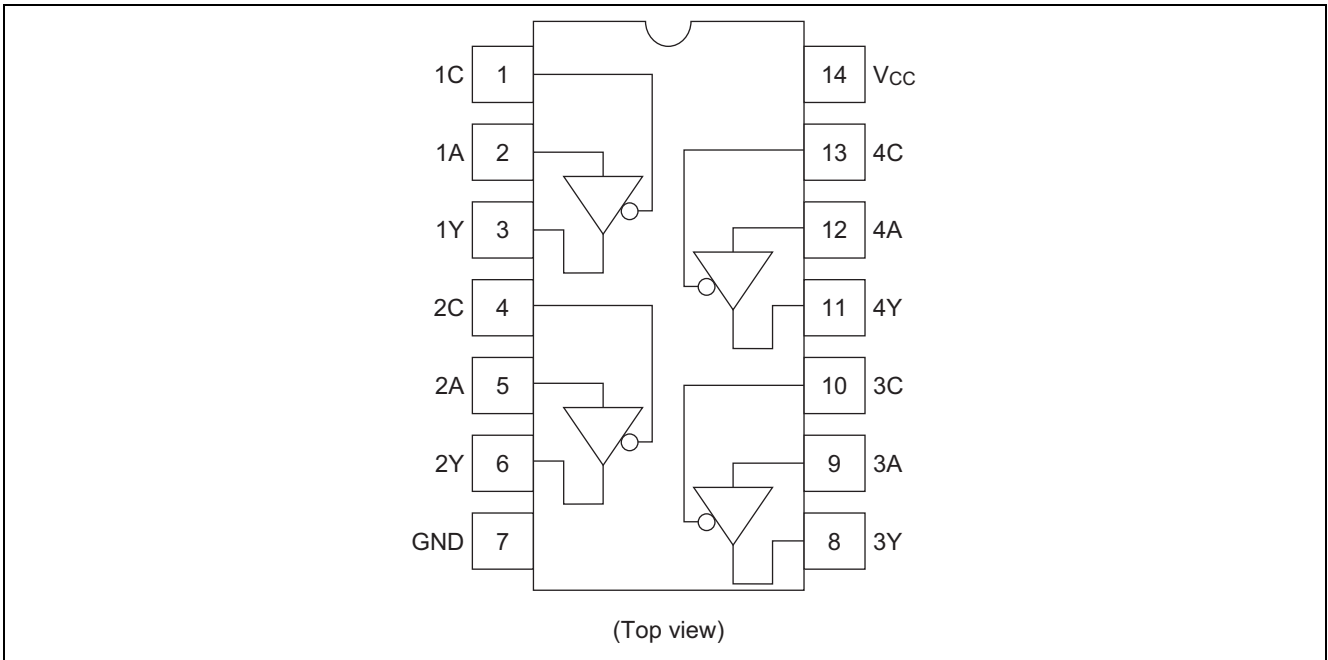
L : Low level

X : Irrelevant

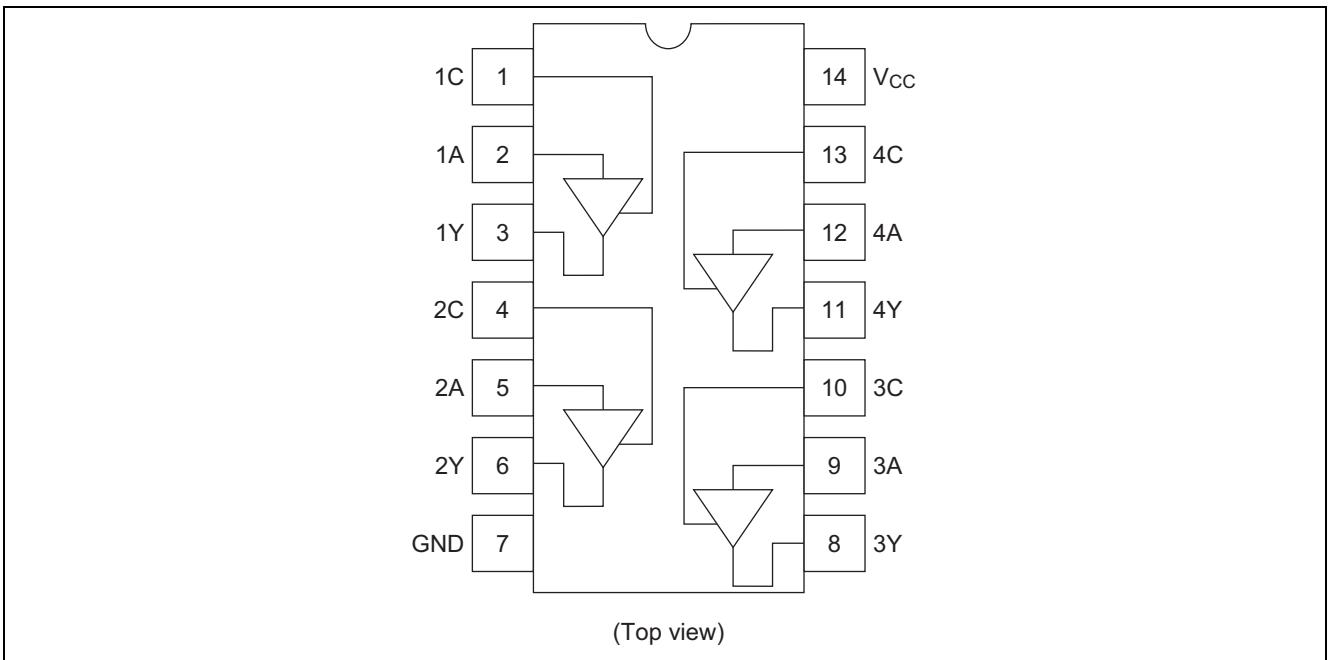
Z : Off (high-impedance) state of a 3-state output.

Pin Arrangement

- HD74HCT125



- HD74HCT126



Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to +7.0	V
Input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V
Output voltage	V_{OUT}	-0.5 to $V_{CC} + 0.5$	V
Output current	I_{OUT}	± 35	mA
DC current drain per V_{CC} , GND	I_{CC} , I_{GND}	± 75	mA
DC input diode current	I_{IK}	± 20	mA
DC output diode current	I_{OK}	± 20	mA
Power dissipation per package	P_T	500	mW
Storage temperature	T_{stg}	-65 to +150	°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}	4.5 to 5.5	V	
Input / Output voltage	V_{IN} , V_{OUT}	0 to V_{CC}	V	
Operating temperature	T_a	-40 to 85	°C	
Input rise / fall time ^{*1}	t_r , t_f	0 to 500	ns	$V_{CC} = 4.5\text{ V}$

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

Waveform: Refer to test circuit of switching characteristics.

Electrical Characteristics

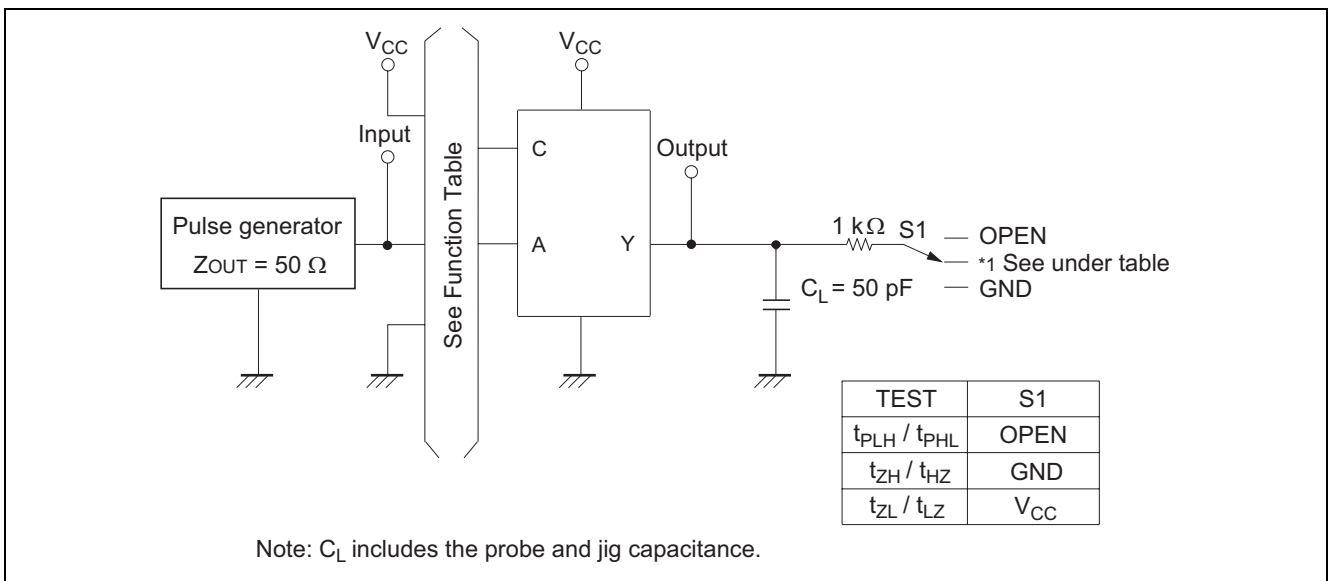
Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40\text{ to }+85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min	Max			
Input voltage	V_{IH}	4.5 to 5.5	2.0	—	—	2.0	—	V		
	V_{IL}	4.5 to 5.5	—	—	0.8	—	0.8	V		
Output voltage	V_{OH}	4.5	4.4	—	—	4.4	—	V	$V_{in} = V_{IH}$ or V_{IL}	$I_{OH} = -20\ \mu\text{A}$
		4.5	4.18	—	—	4.13	—	V		$I_{OH} = -6\ \text{mA}$
	V_{OL}	4.5	—	—	0.1	—	0.1	V		$I_{OL} = 20\ \mu\text{A}$
		4.5	—	—	0.26	—	0.33	V		$I_{OL} = 6\ \text{mA}$
Off-state output current	I_{OZ}	5.5	—	—	± 0.5	—	± 5.0	μA	$V_{in} = V_{IH}$ or V_{IL} , $V_{out} = V_{CC}$ or GND	
Input current	I_{in}	5.5	—	—	± 0.1	—	± 1.0	μA	$V_{in} = V_{CC}$ or GND	
Quiescent supply current	I_{CC}	5.5	—	—	4.0	—	40	μA	$V_{in} = V_{CC}$ or GND, $I_{out} = 0\ \mu\text{A}$	

Switching Characteristics

($C_L = 50 \text{ pF}$, Input $t_r = t_f = 6 \text{ ns}$)

Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } +85^\circ\text{C}$		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t_{PHL}	4.5	—	12	20	—	25	ns	
	t_{PLH}	4.5	—	12	20	—	25		
Output enable time	t_{ZL}	4.5	—	12	30	—	38	ns	
	t_{ZH}	4.5	—	12	30	—	38		
Output disable time	t_{LZ}	4.5	—	15	30	—	38	ns	
	t_{HZ}	4.5	—	15	30	—	38		
Output rise/fall time	t_{TLH}	4.5	—	4	12	—	15	ns	
	t_{THL}	4.5	—	4	12	—	15		
Input capacitance	C_{in}	—	—	5	10	—	10	pF	

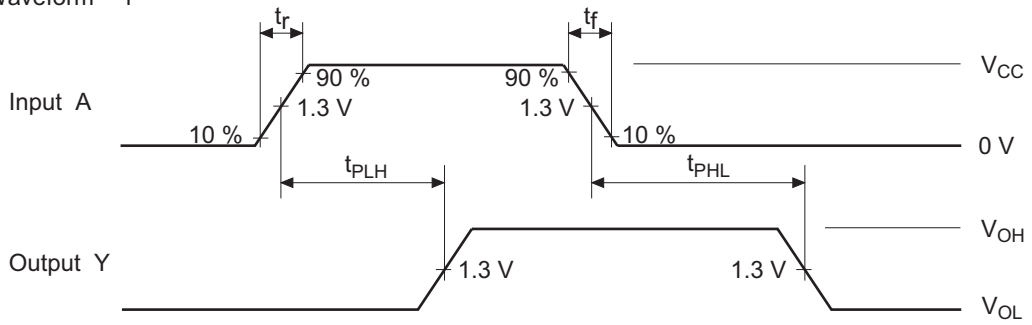
Test Circuit



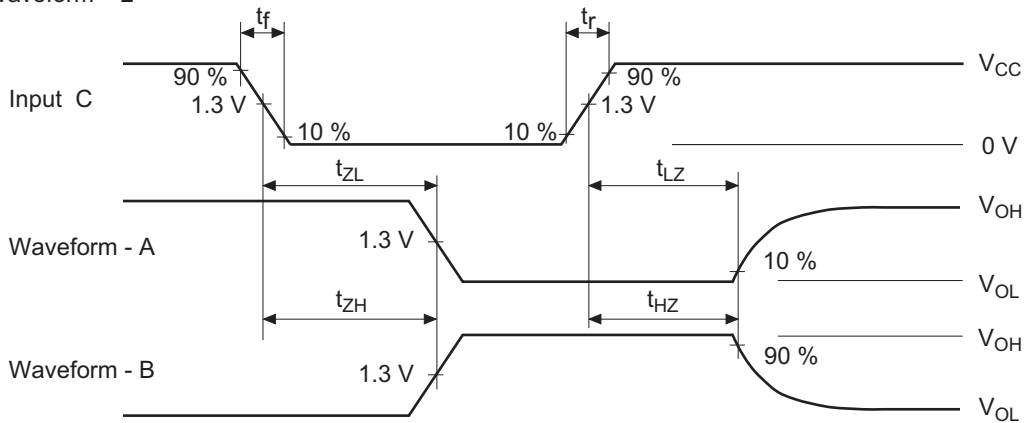
Waveforms

- HD74HCT125

• Waveform – 1



• Waveform – 2

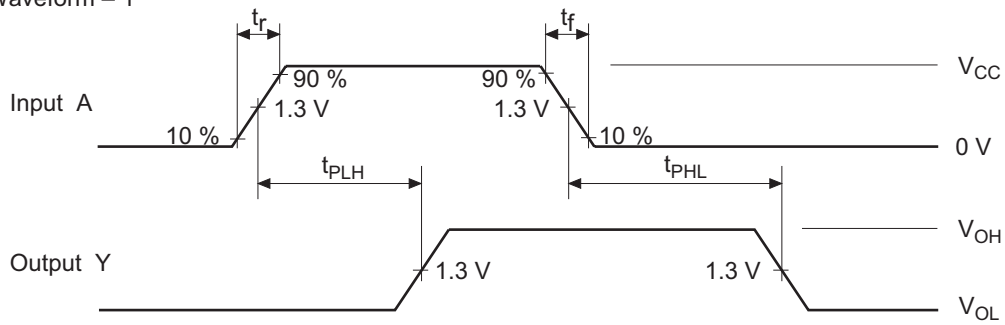


- Notes :
1. $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$
 2. Input waveform : $\text{PRR} \leq 1 \text{ MHz}$, duty cycle 50%
 3. Waveform– A is for an output with internal conditions such that the output is low except when disabled by the output control.
 4. Waveform– B is for an output with internal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

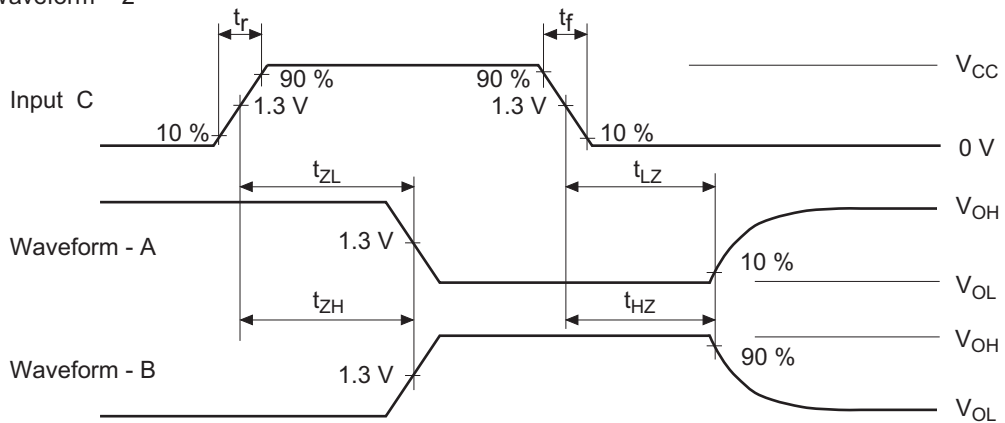
Waveforms

- HD74HCT126

• Waveform – 1

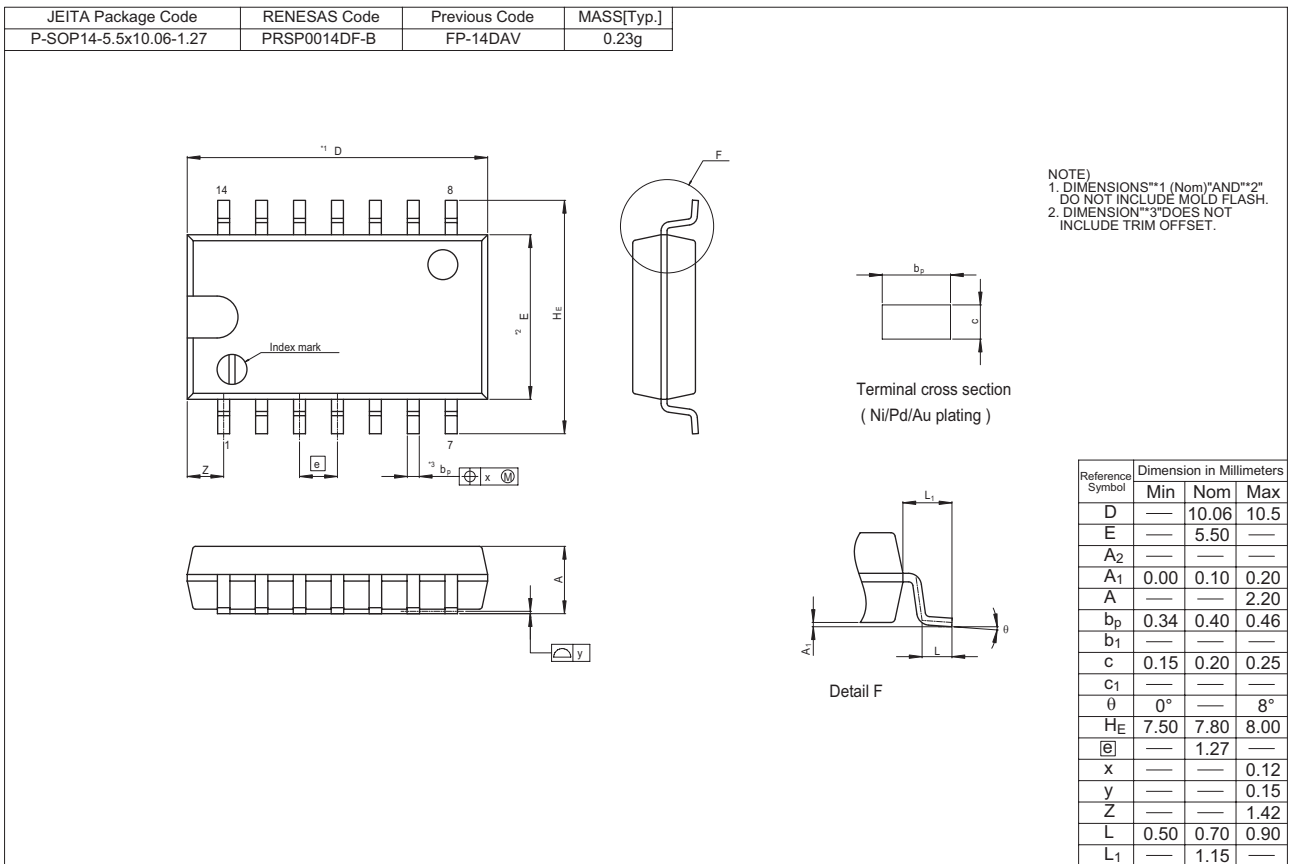
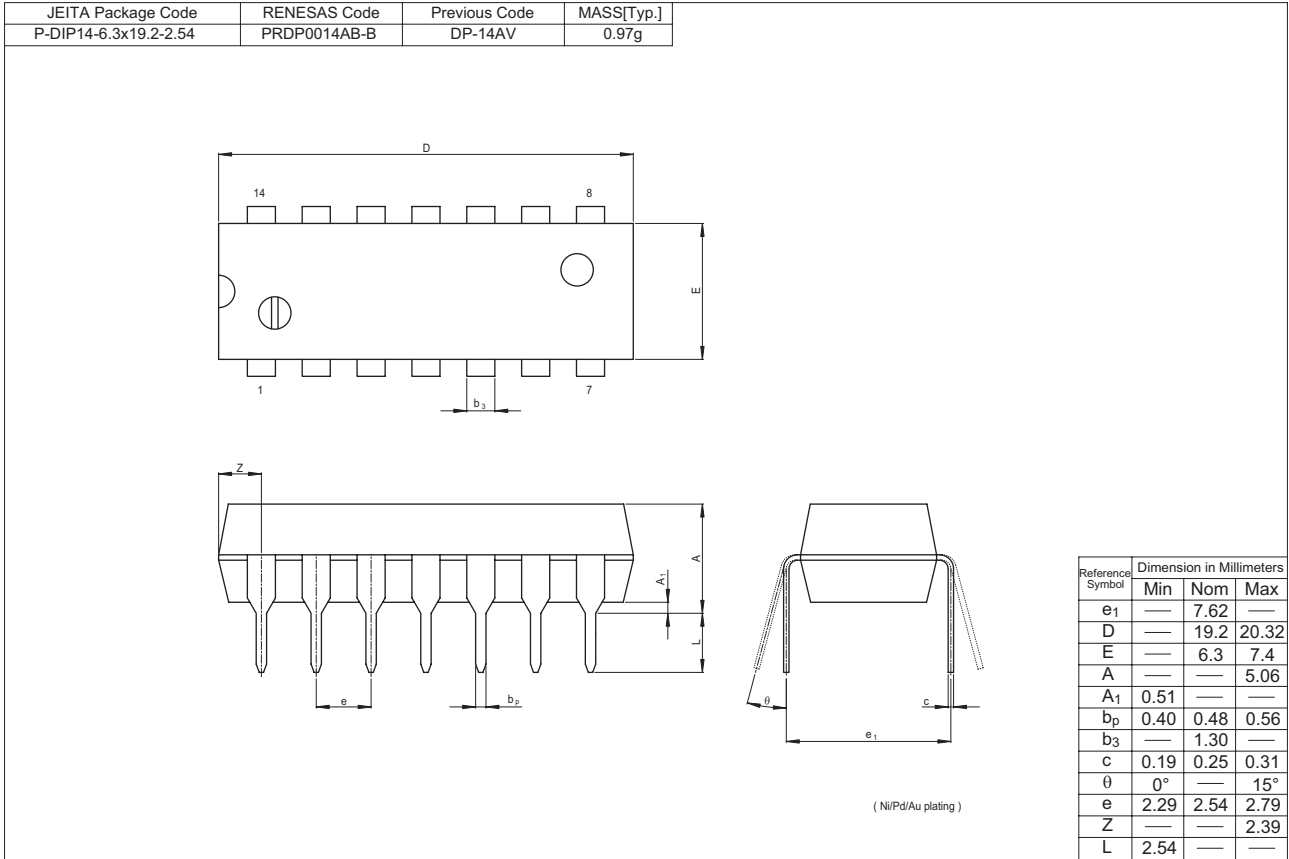


• Waveform – 2



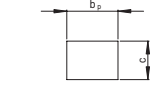
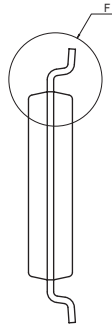
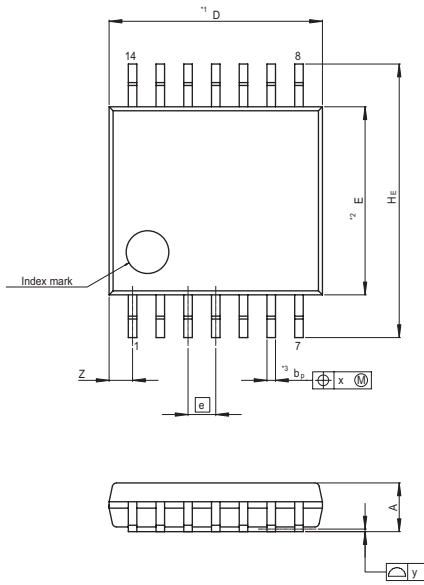
- Notes :
1. $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$
 2. Input waveform : $\text{PRR} \leq 1 \text{ MHz}$, duty cycle 50%
 3. Waveform– A is for an output with internal conditions such that the output is low except when disabled by the output control.
 4. Waveform– B is for an output with internal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

Package Dimensions

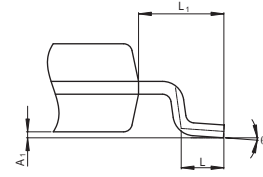


HD74HCT125, HD74HCT126

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-TSSOP14-4.4x5-0.65	PTSP0014JA-B	TTP-14DV	0.05g



Terminal cross section
(Ni/Pd/Au plating)



Detail F

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	—	5.00	5.30
E	—	4.40	—
A ₂	—	—	—
A ₁	0.03	0.07	0.10
A	—	—	1.10
b _p	0.15	0.20	0.25
d ₁	—	—	—
c	0.10	0.15	0.20
c ₁	—	—	—
θ	0°	—	8°
HE	6.20	6.40	6.60
⓪	—	0.65	—
x	—	—	0.13
y	—	—	0.10
Z	—	—	0.83
L	0.4	0.5	0.6
L ₁	—	1.0	—

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