

# HD74BC373A

## Octal D Type Transparent Latches With 3 State Outputs

REJ03D0283-0300Z  
 (Previous ADE-205-009A (Z))  
 Rev.3.00  
 Jul.16.2004

### Description

The HD74BC373A provides high drivability and operation equal to or better than high speed bipolar standard logic IC by using Bi-CMOS process. The device features low power dissipation that is about 1/5 of high speed bipolar logic IC, when the frequency is 10 MHz. The device has eight D type latches with three state outputs in a 20 pin package. When the latch enable input is high, the Q outputs will follow the D inputs. When the latch enable goes low, data at the D inputs will be retained at the outputs until latch enable returns high again. When a high logic level is applied to the output control input, all outputs go to a high impedance state, regardless of what signals are present at the other inputs and the state of the storage elements.

### Features

- Input/Output are at high impedance state when power supply is off.
- Built in input pull up circuit can make input pins be open, when not used.
- TTL level input
- Wide operating temperature range input pins  
 $T_a = -40$  to  $+85^\circ\text{C}$
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74BC373AFPEL	SOP-20 pin (JEITA)	FP-20DAV	FP	EL (2,000 pcs/reel)
HD74BC373ATELL	TSSOP-20 pin	TTP-20DAV	T	ELL (2,000 pcs/reel)

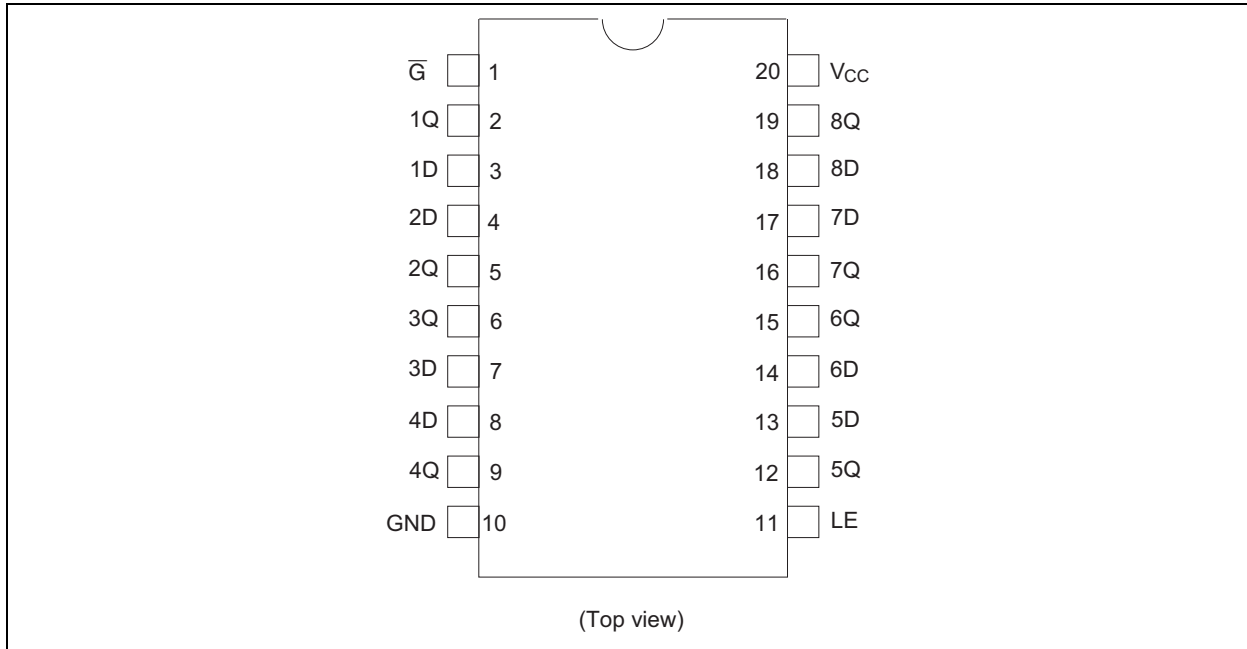
Note: Please consults the sales office for the above package availability.

### Function Table

$\bar{G}$	Inputs		Output Q
	LE	D	
H	X	X	Z
L	H	L	L
L	H	H	H
L	L	X	No change

H : High level  
 L : Low level  
 X : Immaterial  
 Z : High impedance

**Pin Arrangement**



**Absolute Maximum Ratings**

Item	Symbol	Rating	Unit
Supply voltage	$V_{CC}$	-0.5 to +7.0	V
Input diode current	$I_{IK}$	$\pm 30$	mA
Input voltage	$V_{IN}$	-0.5 to +7.5	V
Output voltage	$V_{OUT}$	-0.5 to +7.5	V
Off state output voltage	$V_{OUT(off)}$	-0.5 to +5.5	V
Storage temperature	$T_{stg}$	-65 to +150	$^{\circ}C$

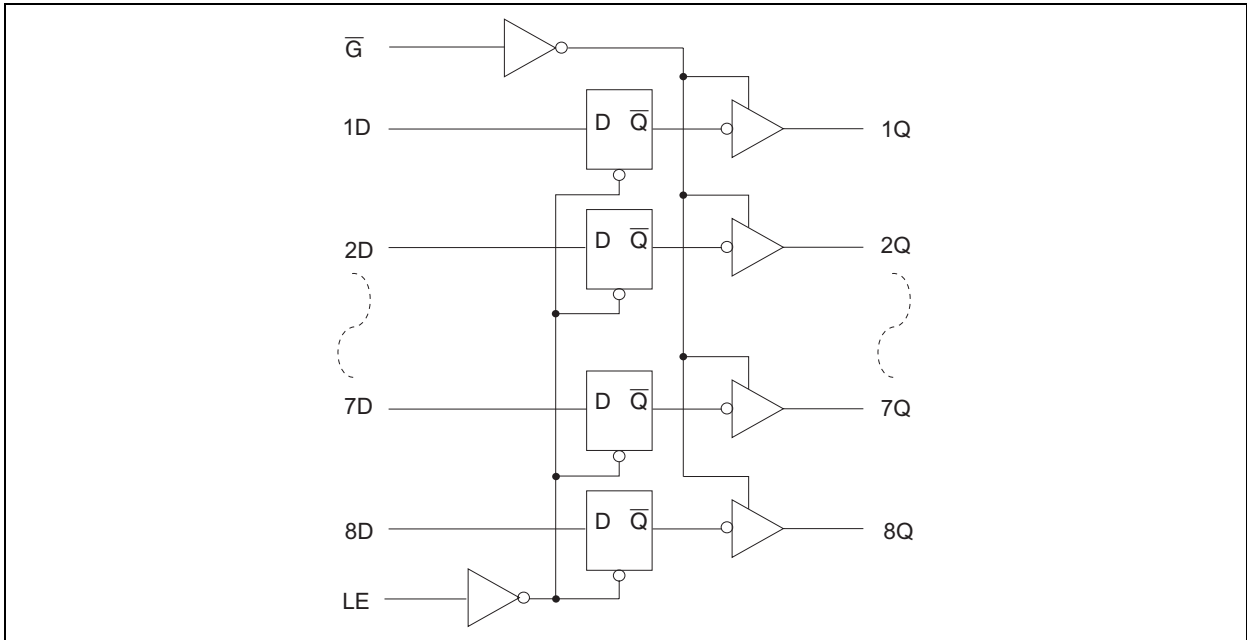
Note: 1. The absolute maximum ratings are values which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

**Recommended Operating Conditions**

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.5	5.0	5.5	V
Input voltage	$V_{IN}$	0	—	$V_{CC}$	V
Output voltage	$V_{OUT}$	0	—	$V_{CC}$	V
Operating temperature	$T_{opr}$	-40	—	85	$^{\circ}C$
Input rise/fall time*1	$t_r, t_f$	0	—	8	ns/V

Note: 1. This item guarantees maximum limit when one input switches.  
Waveform: Refer to test circuit of switching characteristics.

Logic Diagram



**Electrical Characteristics (Ta = -40°C to +85°C )**

Item	Symbol	V <sub>CC</sub> (V)	Min	Max	Unit	Test Conditions
Input voltage	V <sub>IH</sub>		2.0	—	V	
	V <sub>IL</sub>		—	0.8	V	
Output voltage	V <sub>OH</sub>	4.5	2.4	—	V	I <sub>OH</sub> = -3 mA
		4.5	2.0	—	V	I <sub>OH</sub> = -15 mA
	V <sub>OL</sub>	4.5	—	0.4	V	I <sub>OL</sub> = 24 mA
		4.5	—	0.5	V	I <sub>OL</sub> = 48 mA
Input diode voltage	V <sub>IK</sub>	4.5	—	-1.2	V	I <sub>IN</sub> = -18 mA
Input current	I <sub>I</sub>	5.5	—	-250	μA	V <sub>IN</sub> = 0 V
		5.5	—	1.0	μA	V <sub>IN</sub> = 5.5 V
		5.5	—	100	μA	V <sub>IN</sub> = 7.0 V
Short circuit output current*1	I <sub>OS</sub>	5.5	-100	-225	mA	V <sub>IN</sub> = 0 or 5.5 V
Off state output current	I <sub>OZH</sub>	5.5	—	50	μA	V <sub>O</sub> = 2.7 V
	I <sub>OZL</sub>	5.5	—	-50	μA	V <sub>O</sub> = 0.5 V
Supply current	I <sub>CCL</sub>	5.5	—	29.5	mA	V <sub>IN</sub> = 0 or 5.5 V All outputs is "L"
	I <sub>CCH</sub>	5.5	—	2.5	mA	V <sub>IN</sub> = 0 or 5.5 V All outputs is "H"
	I <sub>CCZ</sub>	5.5	—	2.5	mA	V <sub>IN</sub> = 0 or 5.5 V All outputs is "Z"
	I <sub>CCT</sub> *2	5.5	—	1.5	mA	V <sub>IN</sub> = 3.4 or 0.5 V

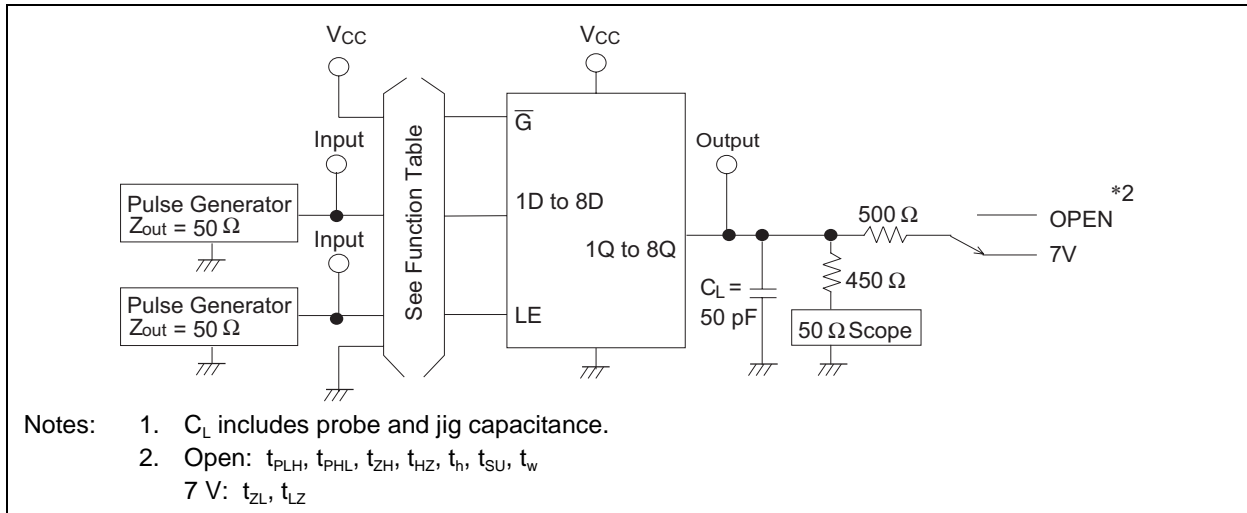
Notes : 1. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.

2. When input by the TTL level, it shows I<sub>CC</sub> increase at per one input pin.

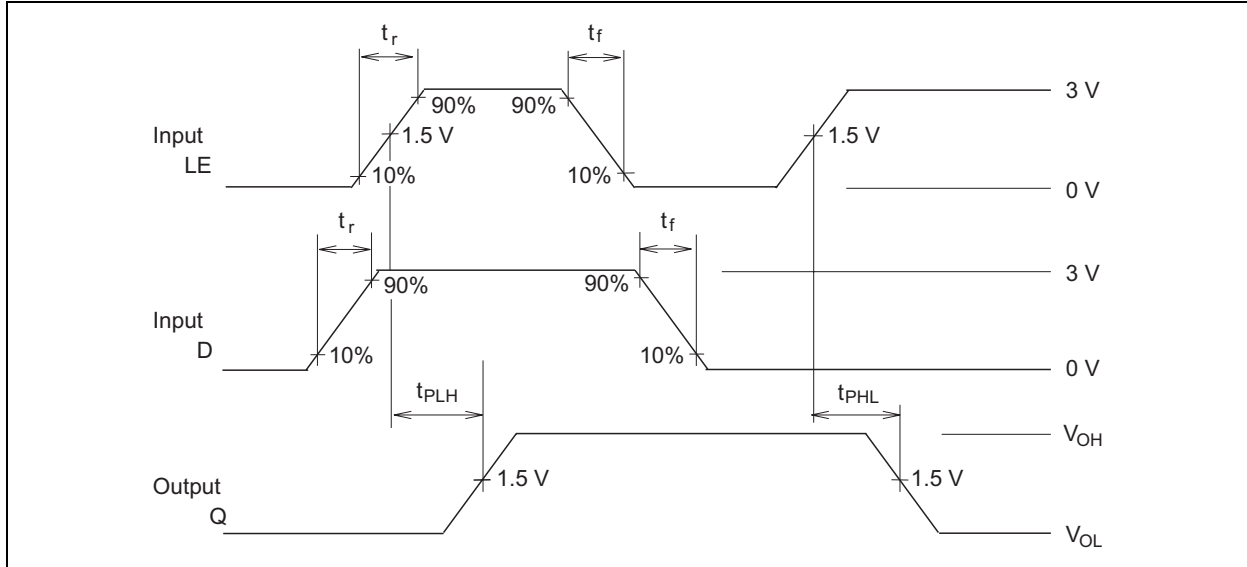
**Switching Test Method (C<sub>L</sub> = 50 pF)**

Item	Symbol	Ta = 25°C V <sub>CC</sub> = 5.0 V		Ta = -40 to 85°C V <sub>CC</sub> = 5.0 V ±10%		Unit	Test Conditions	
		Min	Max	Min	Max			
Propagation delay time	D → Q	t <sub>PLH</sub>	3.0	8.0	3.0	10.0	ns	See under figure
		t <sub>PHL</sub>	3.0	8.0	3.0	10.0		
	LE → Q	t <sub>PLH</sub>	3.0	8.0	3.0	10.0		
		t <sub>PHL</sub>	3.0	8.0	3.0	10.0		
Output enable time	t <sub>ZH</sub>	3.0	9.0	3.0	11.0	ns		
	t <sub>ZL</sub>	3.0	9.0	3.0	11.0			
Output disable time	t <sub>HZ</sub>	3.0	8.0	3.0	10.0	ns		
	t <sub>LZ</sub>	3.0	8.0	3.0	10.0			
Setup time	t <sub>S</sub> (H)	2.0	—	2.0	—	ns		
	t <sub>S</sub> (L)	2.0	—	2.0	—			
Hold time	t <sub>H</sub> (H)	2.0	—	2.0	—	ns		
	t <sub>H</sub> (L)	2.0	—	2.0	—			
Pulse width	t <sub>w</sub>	6.0	—	6.0	—	ns		
Input capacitance	C <sub>IN</sub>	3.0(Typ)		—		pF	V <sub>IN</sub> = V <sub>CC</sub> or GND	
Output capacitance	C <sub>O</sub>	15.0(Typ)		—		pF	V <sub>O</sub> = V <sub>CC</sub> or GND	

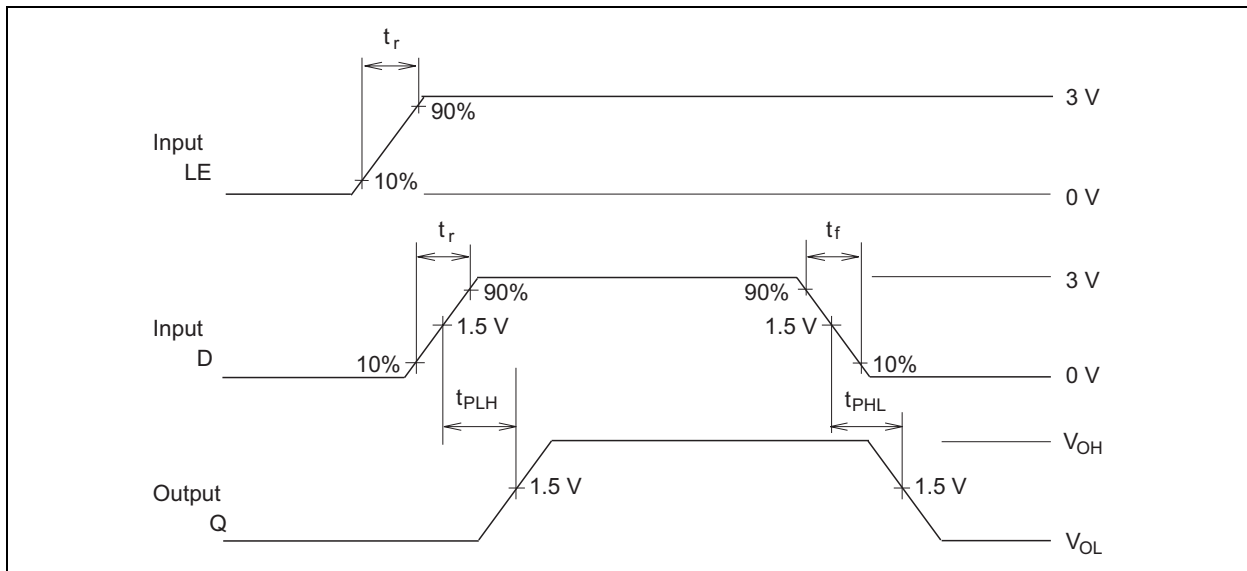
Test Circuit



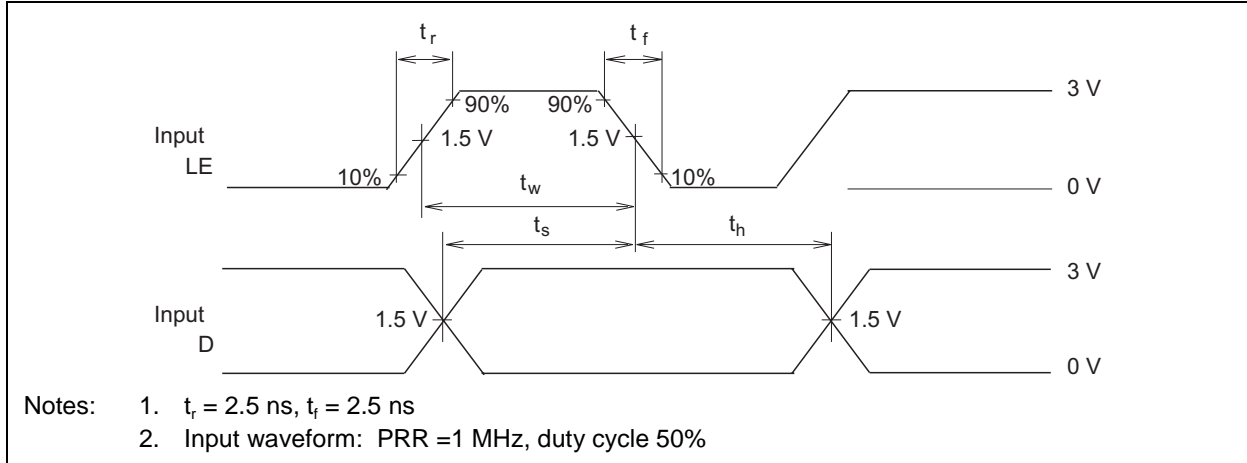
Waveforms-1



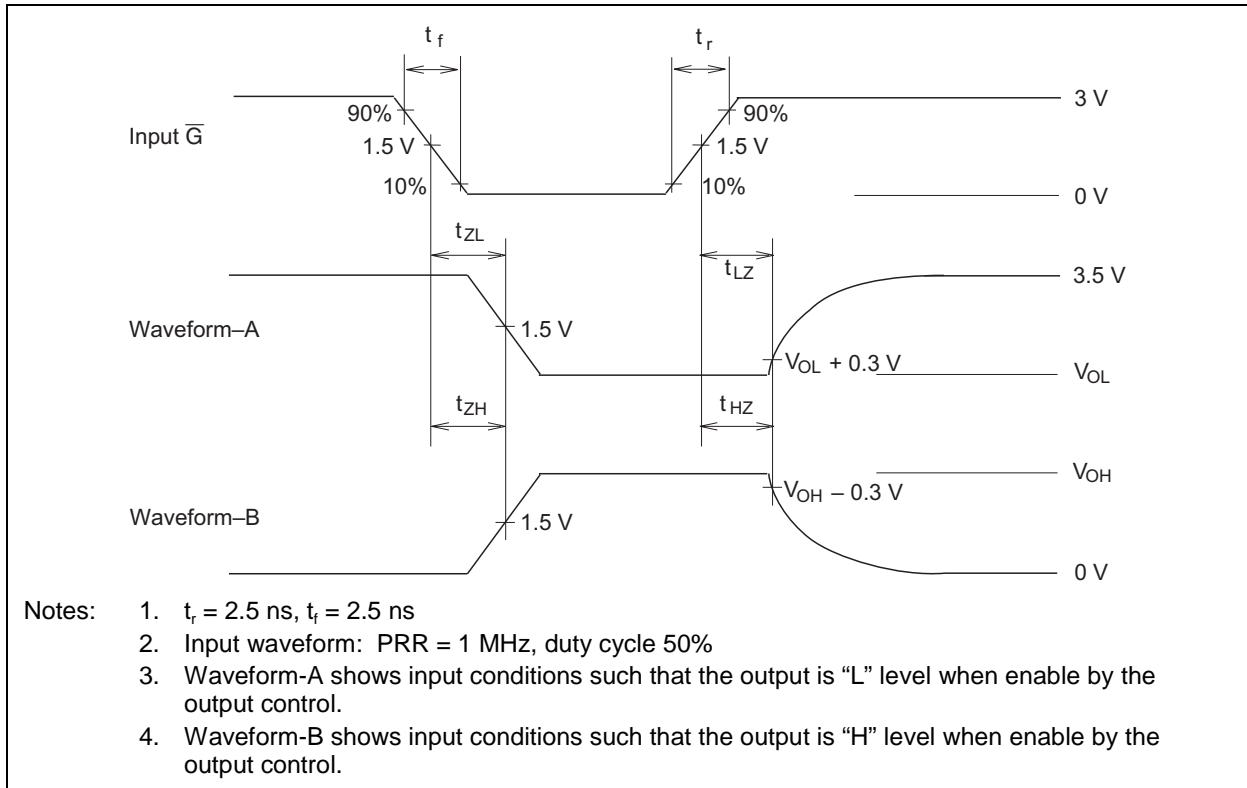
Waveforms-2



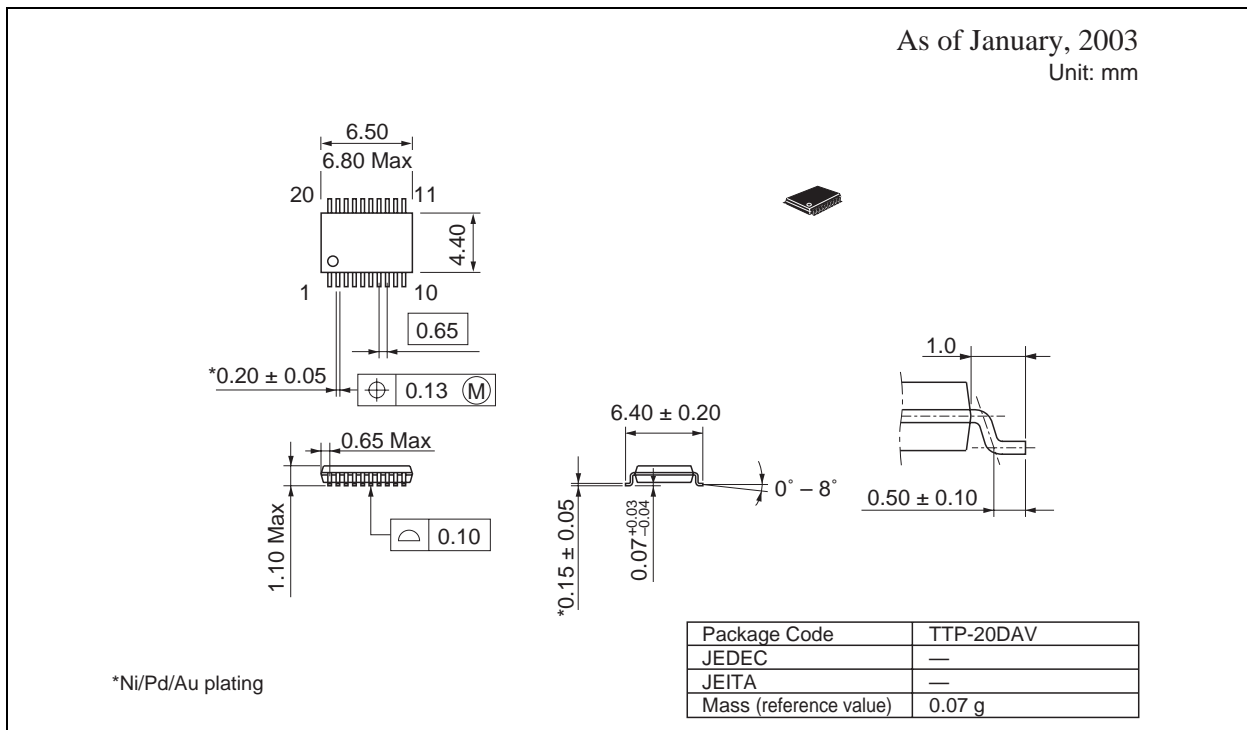
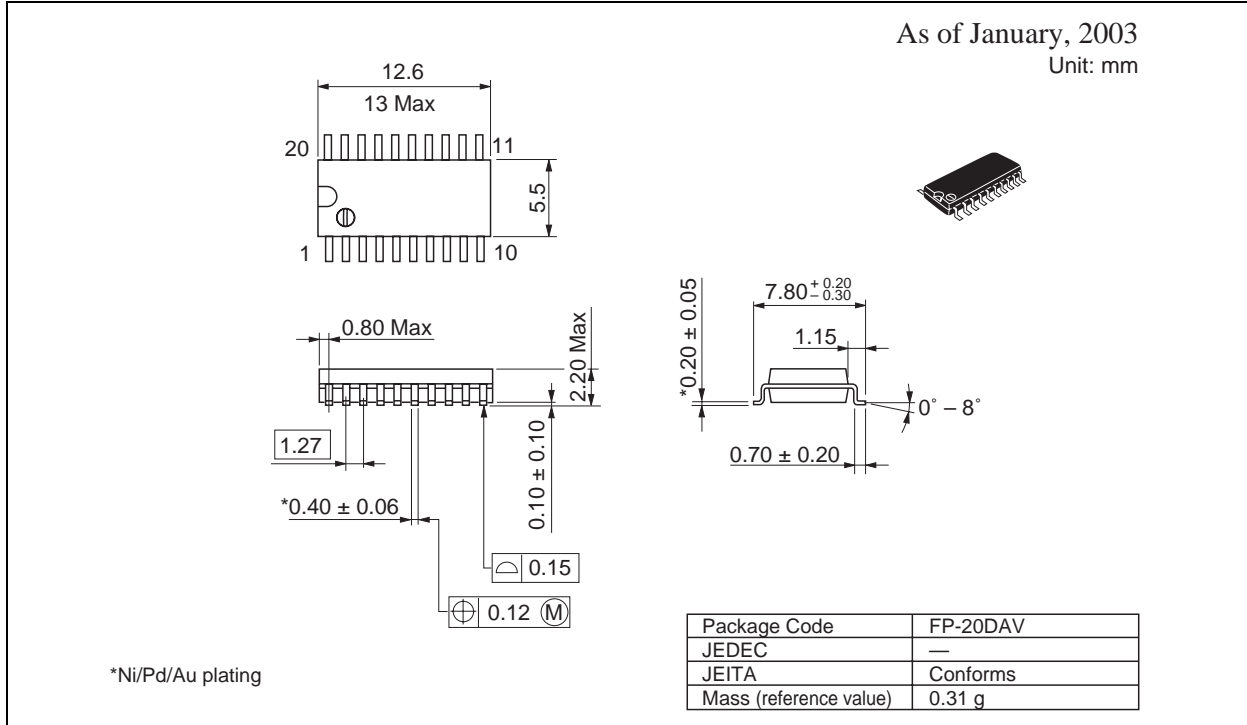
Waveforms-3



Waveforms-4



Package Dimensions





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