

# HD74BC240A

## Octal Buffers/Line Drivers With 3 State Outputs

REJ03D0280-0300Z  
 (Previous ADE-205-006A (Z))  
 Rev.3.00  
 Jul.16.2004

### Description

The HD74BC240A 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 inverter drivers with three state outputs in a 20 pin package. This device is a non inverting buffer and has two active low enables ( $\overline{1G}$  and  $\overline{2G}$ ). Each enable independently controls 4 buffers.

### 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  
 $T_a = -40$  to  $+85^\circ\text{C}$
- Ordering Information

Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74BC240AP	DILP-20 pin	DP-20N, -20NEV	P	—
HD74BC240AFPEL	SOP-20 pin (JEITA)	FP-20DAV	FP	EL (2,000 pcs/reel)
HD74BC240ATELL	TSSOP-20 pin	TTP-20DAV	T	ELL (2,000 pcs/reel)

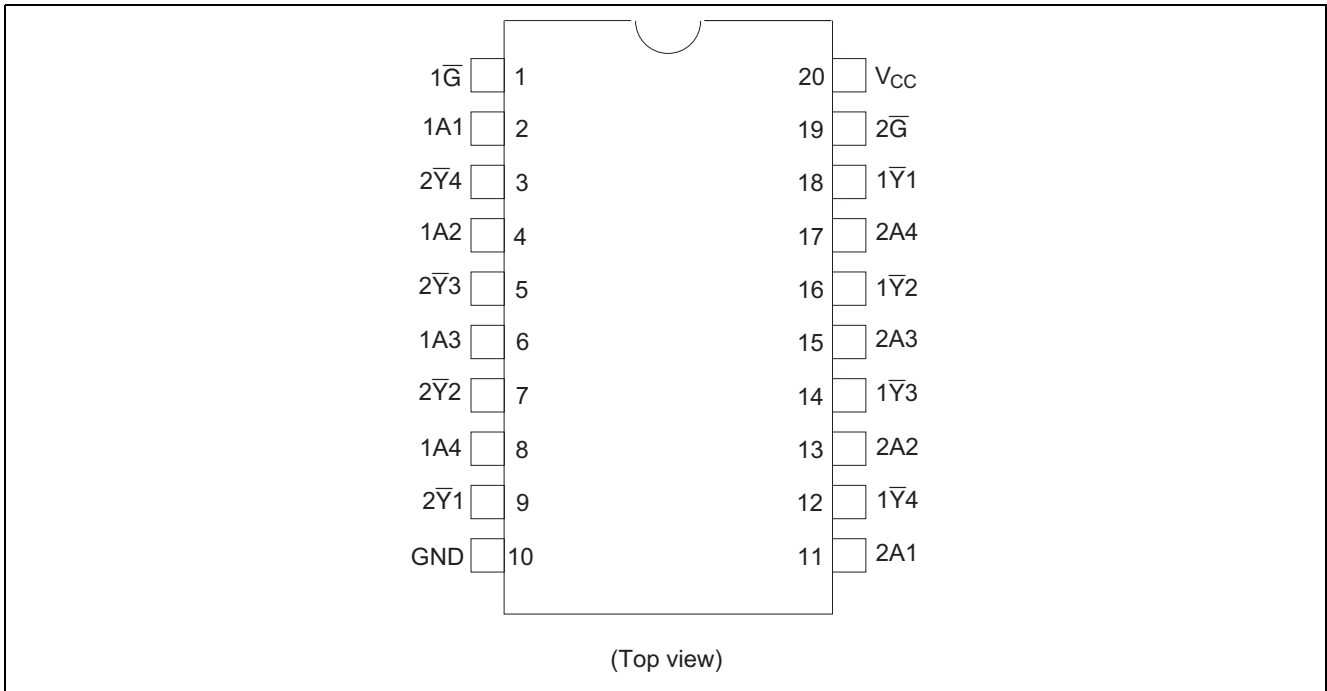
Note: Please consults the sales office for the above package availability.

### Function Table

Inputs		Output $\overline{Y}$
$\overline{G}$	A	
H	X	Z
L	H	L
L	L	H

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	°C

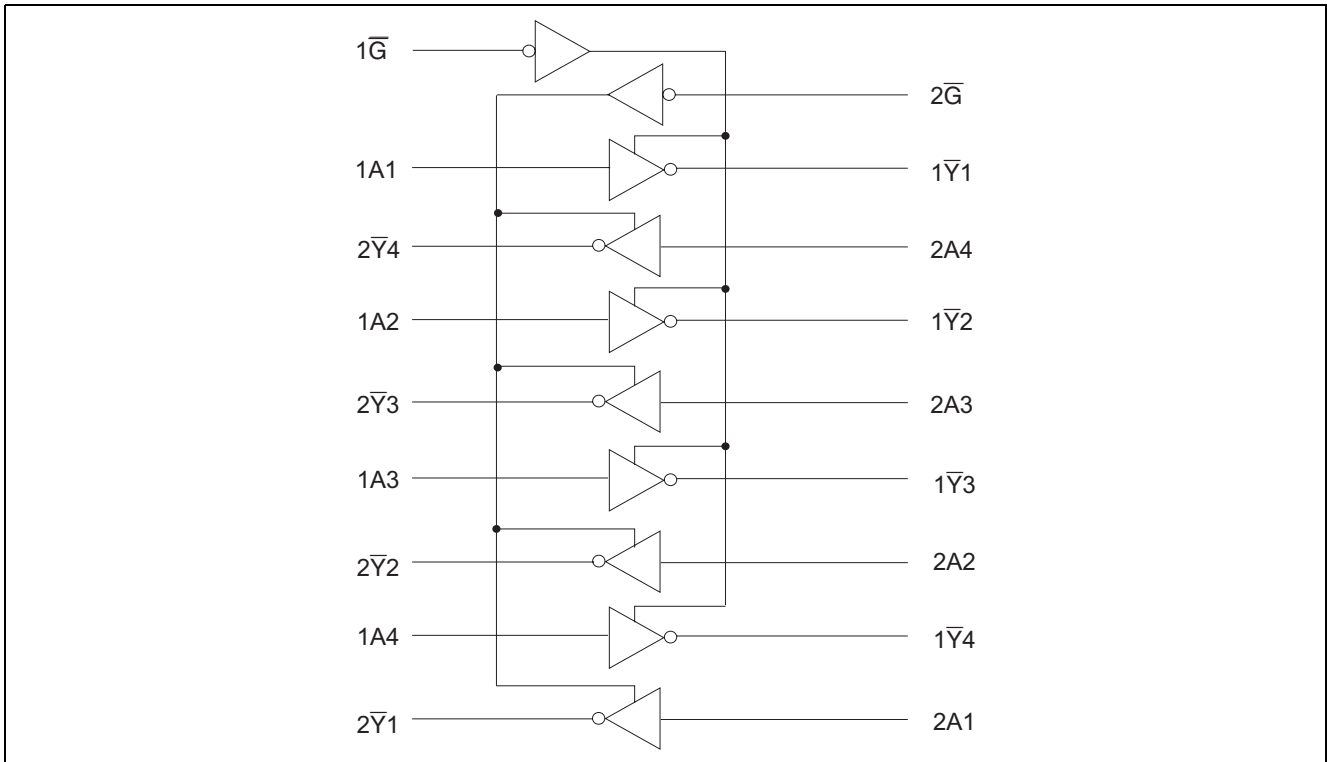
Note: 1. The absolute maximum ratings are values which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

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	°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)

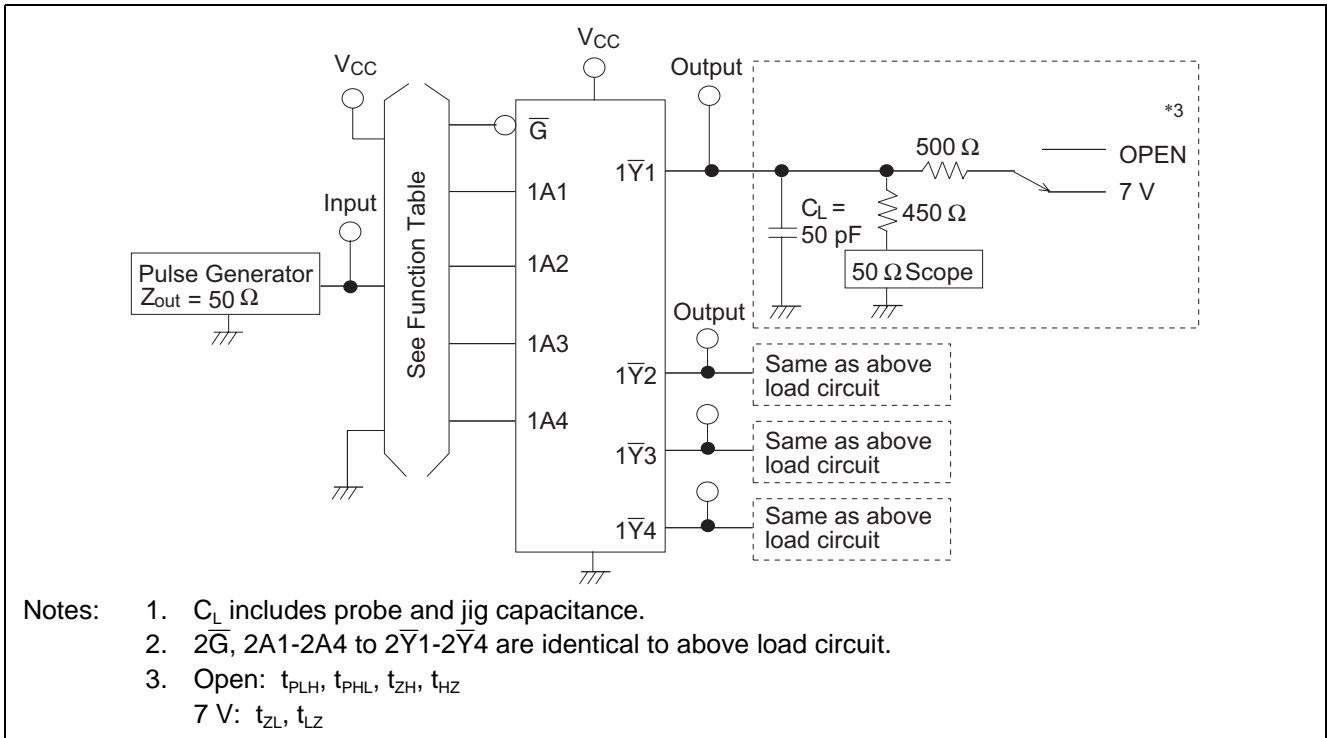
Item	Symbol	V <sub>CC</sub> (V)	Min	Max	Unit	Test Conditions
Input voltage	V <sub>IH</sub>		2.0	—	V	
	V <sub>IL</sub>		—	0.8	V	
Output voltage	V <sub>OH</sub>	4.5	2.4	—	V	I <sub>OH</sub> = -3 mA
		4.5	2.0	—	V	I <sub>OH</sub> = -15 mA
	V <sub>OL</sub>	4.5	—	0.5	V	I <sub>OL</sub> = 48 mA
		4.5	—	0.55	V	I <sub>OL</sub> = 64 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	—	27.5	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.

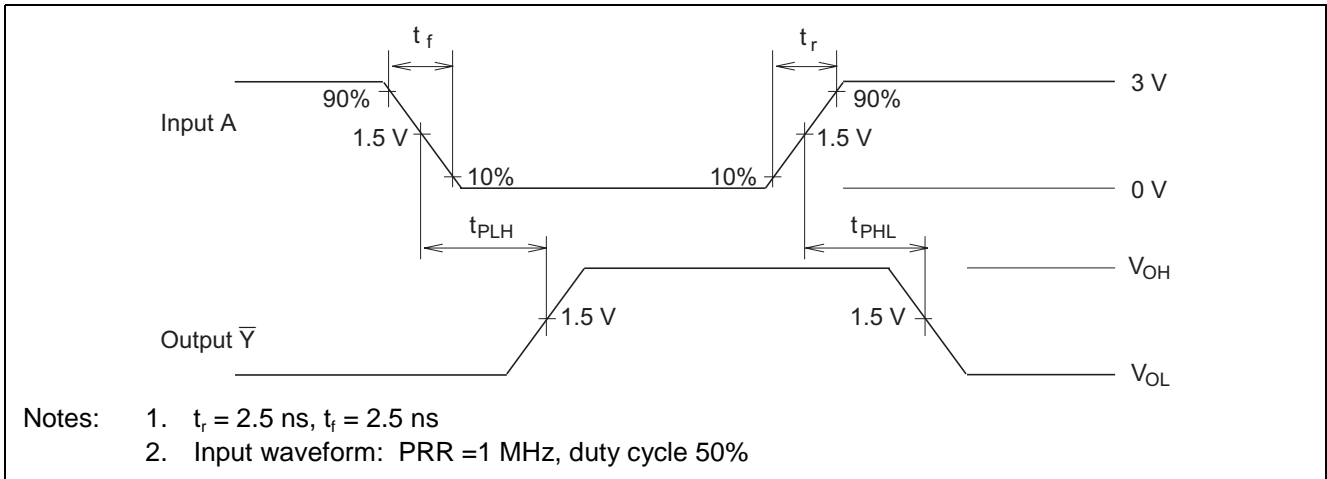
**Switching Test Method** (C<sub>L</sub> = 50 pF)

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	t <sub>PLH</sub>	3.0	6.0	3.0	7.0	ns	See under figure	
	t <sub>PHL</sub>	3.0	6.0	3.0	7.0			
Output enable time	t <sub>ZH</sub>	3.0	8.0	3.0	10.0	ns		
	t <sub>ZL</sub>	3.0	8.0	3.0	10.0			
Output disable time	t <sub>HZ</sub>	3.0	7.0	3.0	9.0	ns		
	t <sub>LZ</sub>	3.0	7.0	3.0	9.0			
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

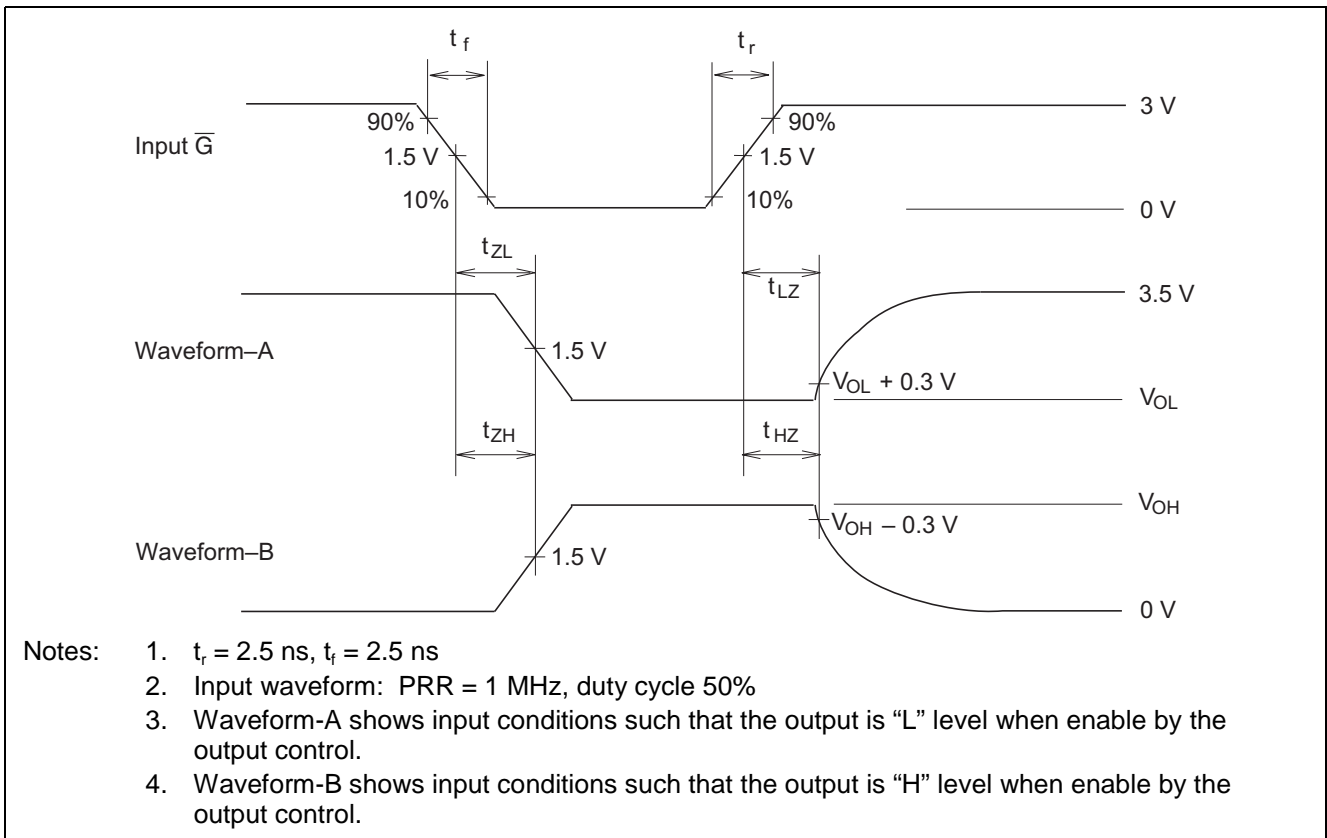
Test Circuit



Waveforms-1

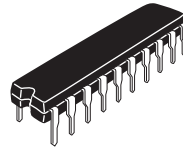
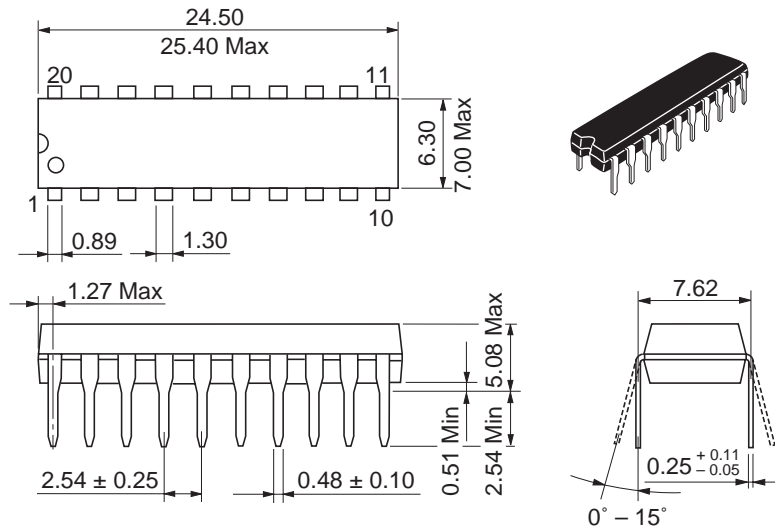


Waveforms-2



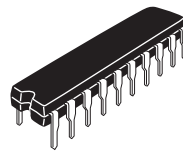
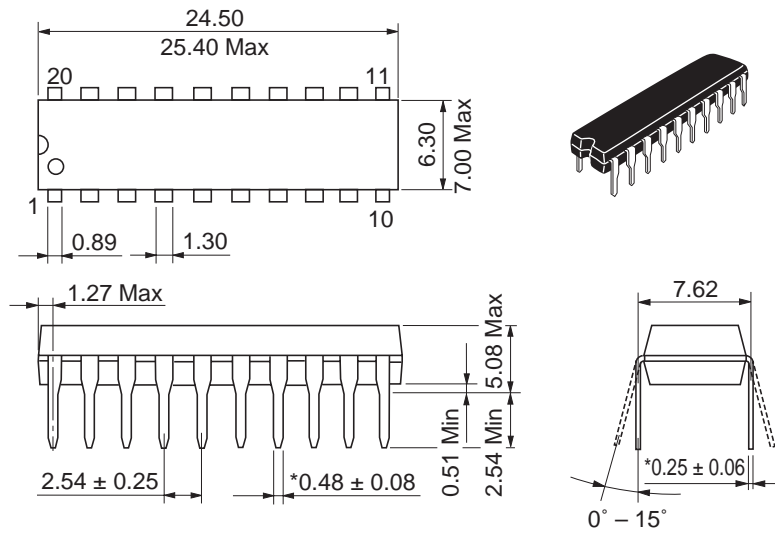
Package Dimensions

As of January, 2003  
Unit: mm



Package Code	DP-20N
JEDEC	—
JEITA	Conforms
Mass (reference value)	1.26 g

Unit: mm

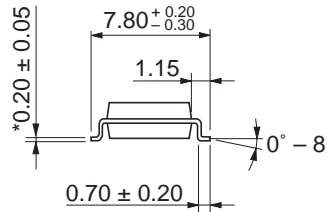
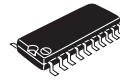
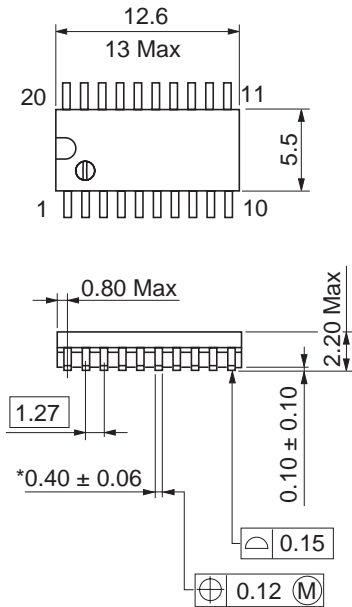


\*Ni/Pd/AU Plating

Package Code	DP-20NEV
JEDEC	—
JEITA	Conforms
Mass (reference value)	1.26 g

As of January, 2003

Unit: mm

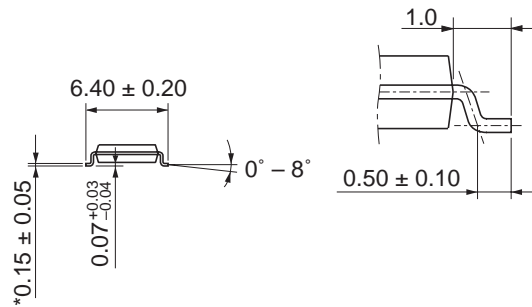
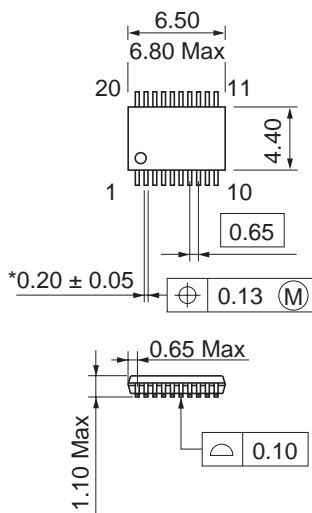


\*Ni/Pd/Au plating

Package Code	FP-20DAV
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.31 g

As of January, 2003

Unit: mm



\*Ni/Pd/Au plating

Package Code	TTP-20DAV
JEDEC	—
JEITA	—
Mass (reference value)	0.07 g



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