

HD14050B

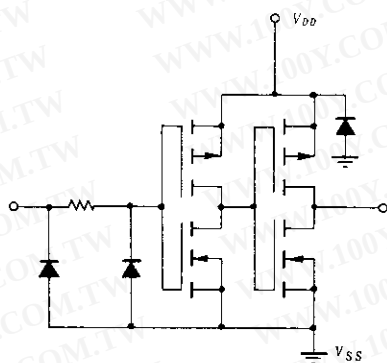
Hex Buffer

The HD14050B noninverting hex buffer finds primary use where low power dissipation and/or high noise immunity is desired. This device provides logic-level conversion using only one supply voltage, V_{CC} . The input-signal high level (V_{IH}) can exceed the V_{CC} supply voltage for logic-level conversions. Two TTL Loads can be driven when the devices are used as CMOS-to-TTL converters ($V_{CC} = 5V$, $V_{OL} \leq 0.4V$, $I_{OL} \geq 3.2mA$).

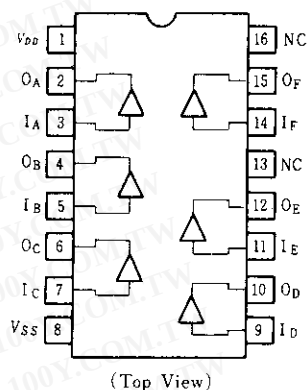
FEATURES

- High Source and Sink Currents
- High-to-Low Level Converter
- Quiescent Current = 2nA/pkg typ. @5V
- Supply Voltage Range = 3 to 18V
- Pin-for-Pin Replacement for MC14050B

CIRCUIT SCHEMATIC (1/6)



PIN ARRANGEMENT

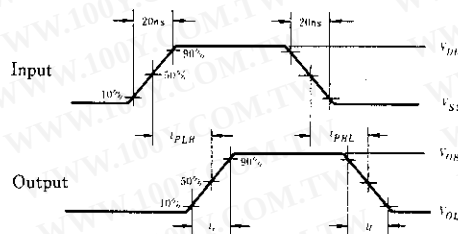
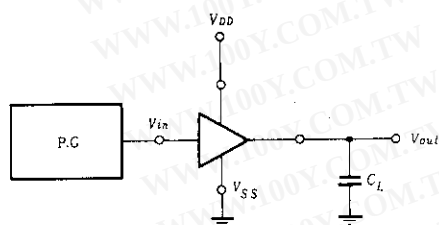


MAXIMUM RATINGS (Voltages referenced to V_{SS})

Characteristic	Symbol	Value	Unit
DC Supply Voltage	V_{DD}	-0.5 ~ +18	V
Input Voltage	V_{in}	-0.5 ~ +18	V
DC Current Drain per Input Pin	I_{in}	10	mA
DC Current Drain per Output Pin	I_{out}	45	mA
Operating Temperature Range	T_A	-40 ~ +85	°C
Storage Temperature Range	T_{stg}	-65 ~ +150	°C
Power Dissipation	P_D	300	mW

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

SWITCHING TIME TEST CIRCUIT



ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	$V_{DD}(V)$	Test Conditions	-40°C		25°C			85°C		Unit
				min	max	min	typ	max	min	max	
Output Voltage	V_{OL}	5.0	$V_{in} = 0$	—	0.05	—	0	0.05	—	0.05	V
		10		—	0.05	—	0	0.05	—	0.05	
		15		—	0.05	—	0	0.05	—	0.05	
	V_{OH}	5.0	$V_{in} = V_{DD}$	4.95	—	4.95	5.0	—	4.95	—	V
		10		9.95	—	9.95	10	—	9.95	—	
		15		14.95	—	14.95	15	—	14.95	—	
Input Voltage	V_{IL}	5.0	$V_{out} = 0.5V$	—	1.5	—	2.25	1.5	—	1.5	V
		10	$V_{out} = 1.0V$	—	3.0	—	4.50	3.0	—	3.0	
		15	$V_{out} = 1.5V$	—	4.0	—	6.75	4.0	—	4.0	
	V_{IH}	5.0	$V_{out} = 4.5V$	3.5	—	3.5	2.75	—	3.5	—	V
		10	$V_{out} = 9.0V$	7.0	—	7.0	5.50	—	7.0	—	
		15	$V_{out} = 13.5V$	11.0	—	11.0	8.25	—	11.0	—	
Output Drive Current	I_{OH}	5.0	$V_{OH} = 2.5V$	-1.5	—	-1.25	-2.5	—	-1.0	—	mA
		10	$V_{OH} = 9.5V$	-1.5	—	-1.25	-2.5	—	-1.0	—	
		15	$V_{OH} = 13.5V$	-4.5	—	-3.75	-10	—	-3.0	—	
	I_{OL}	5.0	$V_{OL} = 0.4V$	3.6	—	3.2	6.0	—	2.5	—	mA
		10	$V_{OL} = 0.5V$	9.6	—	8.0	16	—	6.6	—	
		15	$V_{OL} = 1.5V$	28	—	24	40	—	19	—	
Input Current	I_{in}	15		—	± 0.3	—	± 0.0001	± 0.3	—	± 1.0	μA
Input Capacitance	C_{in}	—	$V_{in} = 0$	—	—	—	10	15	—	—	pF
Quiescent Current	I_{DD}	5.0	Zero Signal, per Package	—	4.0	—	0.002	4.0	—	30	μA
		10		—	8.0	—	0.004	8.0	—	60	
		15		—	16	—	0.006	16	—	120	
Total Supply Current*	I_T	5.0	Dynamic + I_{DD} ,	—	—	—	1.77	—	—	—	μA
		10	per Gate	—	—	—	3.54	—	—	—	
		15	$C_L = 50pF, f = 1kHz$	—	—	—	5.31	—	—	—	

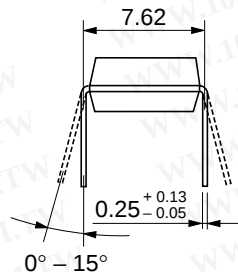
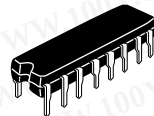
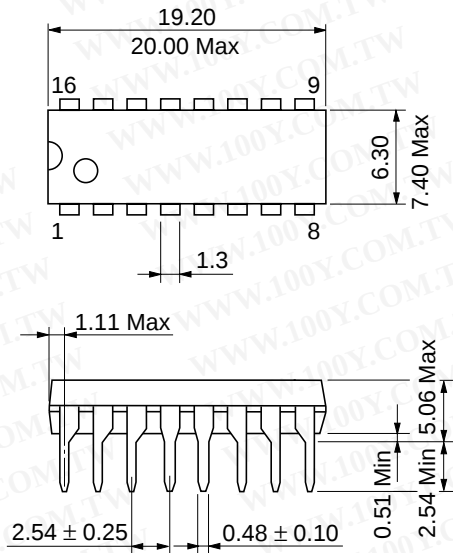
* To calculate total supply current at frequency other than 1kHz.

@ $V_{DD} = 5.0V$ $I_T = (1.77\mu A/kHz)f + I_{DD}$ @ $V_{DD} = 10V$ $I_T = (3.54\mu A/kHz)f + I_{DD}$ @ $V_{DD} = 15V$ $I_T = (5.31\mu A/kHz)f + I_{DD}$

SWITCHING CHARACTERISTICS ($C_L = 50pF, T_a = 25^\circ C$)

Characteristic	Symbol	$V_{DD}(V)$	min	typ	max	Unit
Output Rise Time	t_r	5.0	—	100	200	ns
		10	—	50	100	
		15	—	40	80	
Output Fall Time	t_f	5.0	—	40	80	ns
		10	—	20	40	
		15	—	15	30	
Propagation Delay Time	t_{PLH}	5.0	—	80	160	ns
		10	—	40	80	
		15	—	30	60	
	t_{PHL}	5.0	—	60	100	ns
		10	—	30	50	
		15	—	20	35	

Unit: mm



Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g

Unit: mm

The figure shows the mechanical specifications for the Hitachi FP-16DA package. It includes a top view, a side view, and a detail view of the lead profile.

Top View Dimensions:

- Overall width: 10.06
- Maximum width: 10.5 Max
- Pin pitch (top): 1.27
- Pin pitch (bottom): 0.42 ± 0.08 (including plating thickness) and 0.40 ± 0.06 (base material dimension)
- Pin width: 0.12 (M)
- Distance from pin center to mounting hole: 0.15
- Mounting hole diameter: 0.12 (M)
- Distance from mounting hole to edge: 0.10 $\pm$ 0.10
- Overall height: 5.5
- Pin 1 indicator: A circle with a dot.

Side View Dimensions:

- Maximum height: 2.20 Max
- Lead height: 0.80 Max
- Lead thickness: 0.20 $\pm$ 0.04
- Lead width: 0.70 $\pm$ 0.20
- Lead angle: 0° - 8°

Detail View Dimensions:

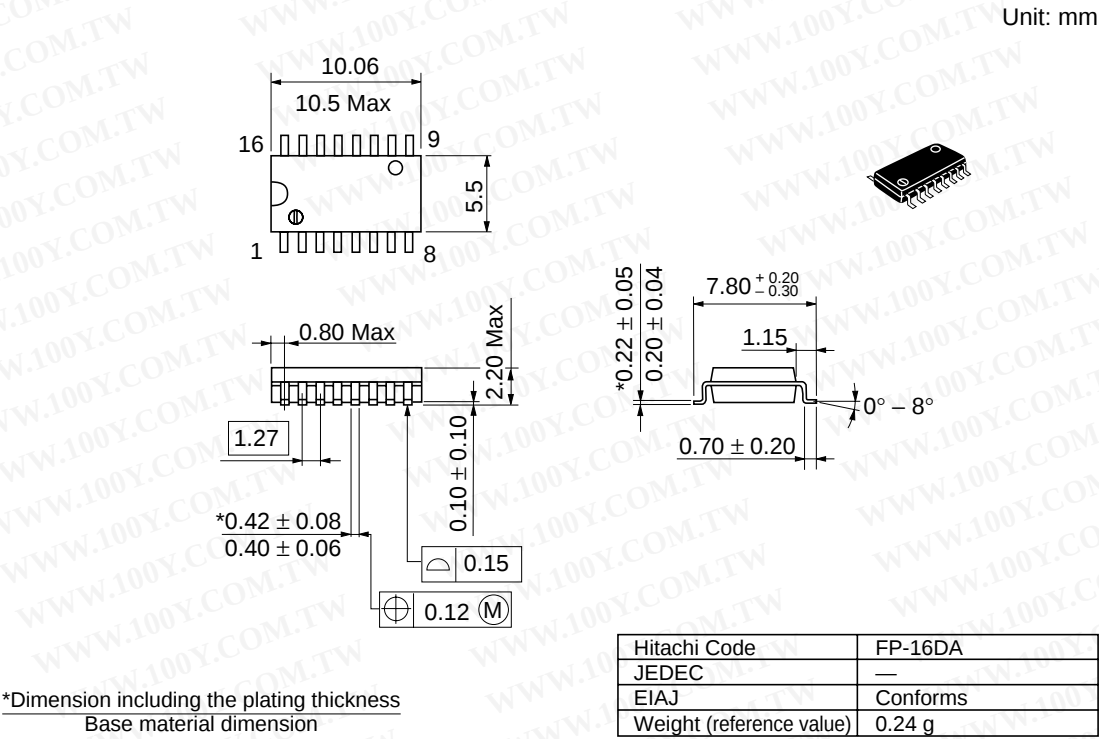
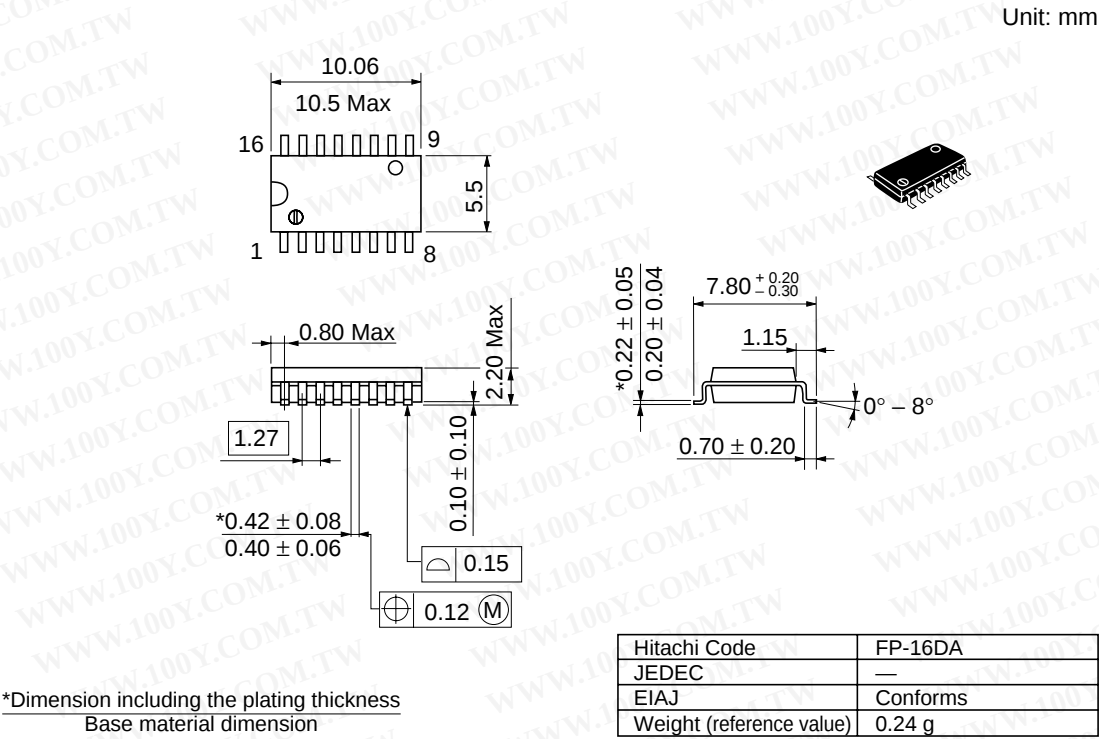
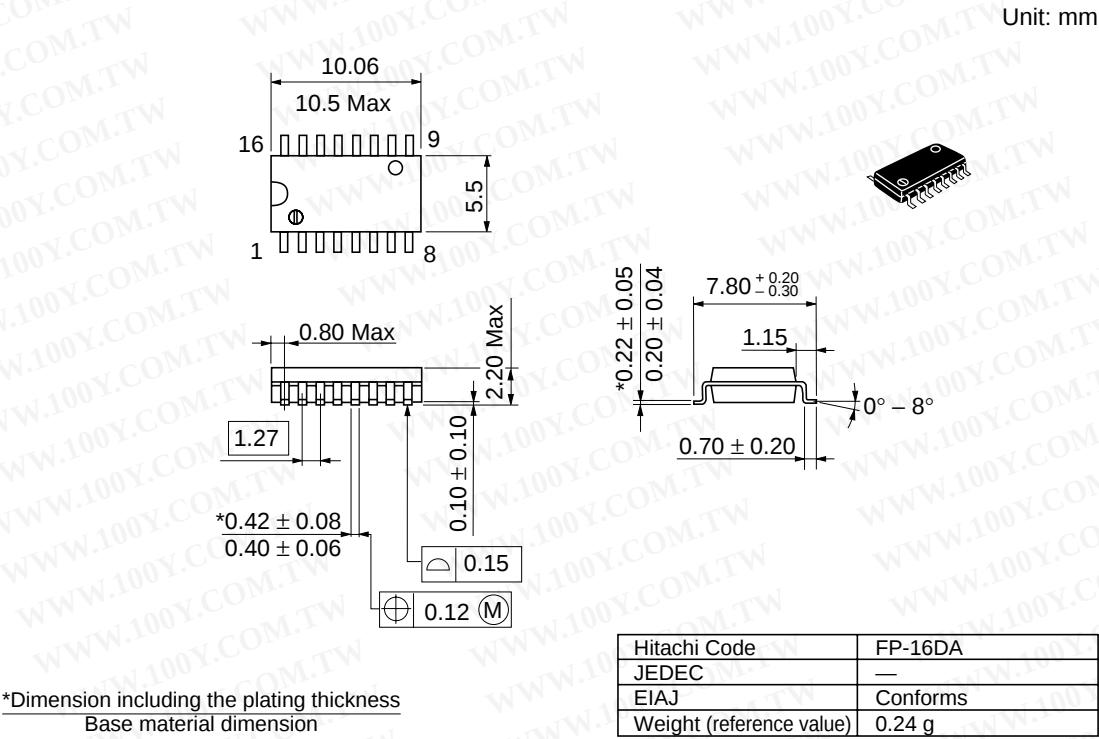
- Lead width: 1.15
- Lead thickness: 0.22 $\pm$ 0.05
- Lead width at base: 7.80 $\pm$ 0.20

Table:

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g

Notes:

- *Dimension including the plating thickness
- Base material dimension



Unit: mm

The figure shows the mechanical specifications for the Hitachi FP-16DA package. It includes a top view, a side view, and a detail view of the lead profile.

Top View Dimensions:

- Overall width: 10.06
- Maximum lead width: 10.5 Max
- Lead pitch: 1.27
- Lead width: 0.42 ± 0.08
- Base width: 0.40 ± 0.06
- Lead thickness: 0.12 (M)
- Lead angle: 0° - 8°

Side View Dimensions:

- Overall height: 5.5
- Lead height: 0.20 ± 0.04
- Lead thickness: 0.22 ± 0.05
- Lead width: 0.70 ± 0.20
- Lead angle: 0° - 8°

Detail View Dimensions:

- Lead width: 1.15
- Lead thickness: 0.15
- Lead angle: 0° - 8°

Table:

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g

Unit: mm

The figure shows the mechanical specifications for the Hitachi FP-16DA package. It includes a top view, a side view, and a detail view of the lead profile.

Top View Dimensions:

- Overall width: 10.06
- Maximum lead width: 10.5 Max
- Lead pitch: 1.27
- Lead width: 0.42 ± 0.08
- Base width: 0.40 ± 0.06
- Lead thickness: 0.12 (M)
- Lead angle: 0° - 8°

Side View Dimensions:

- Overall height: 5.5
- Lead height: 0.20 ± 0.04
- Lead thickness: 0.22 ± 0.05
- Lead width: 0.70 ± 0.20
- Lead angle: 0° - 8°

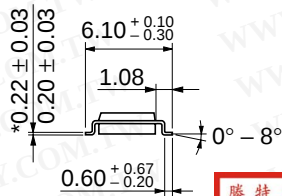
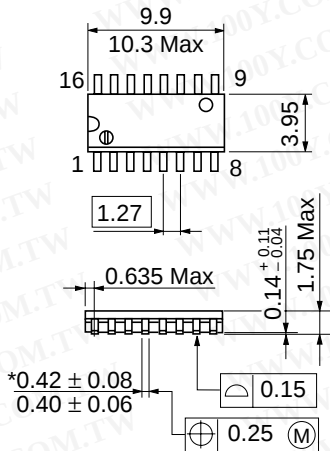
Detail View Dimensions:

- Lead width: 1.15
- Lead thickness: 0.15
- Lead angle: 0° - 8°

Table:

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g

Unit: mm



勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

*Dimension including the plating thickness
 Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g