

HD14049UB

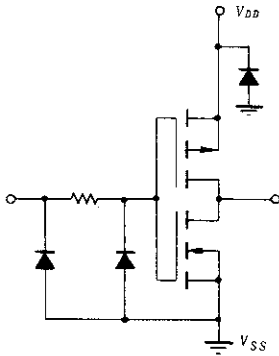
Hex Inverter/Buffer

The HD14049UB hex inverter/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 ($V_{CC} = 5V$, $V_{OL} \leq 0.4V$, $I_{OL} \geq 3.2mA$).

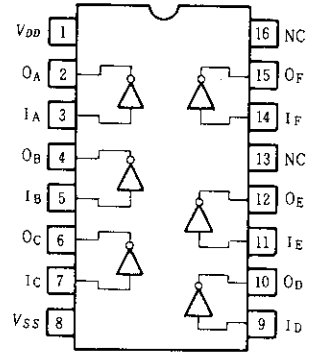
FEATURES

- High Source and Sink Current
- High-to-Low Level Converter
- Quiescent Current = 2nA/pkg typ. @5V
- Supply Voltage Range = 3 to 18V
- Pin-for-Pin Replacement for MC14049UB

CIRCUIT SCHEMATIC (1/6)



PIN ARRANGEMENT

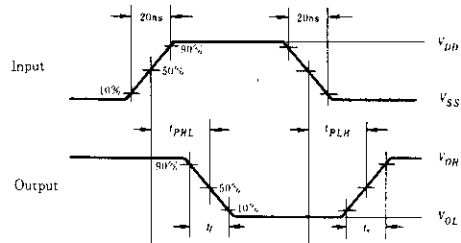
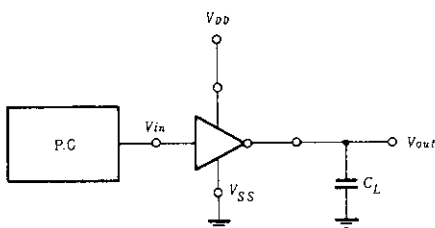


(Top View)

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

SWITCHING TIME TEST CIRCUIT



ELECTRICAL CHARACTERISTICS

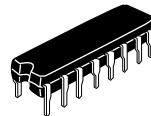
Characteristic	Symbol	$V_{DD}(V)$	Test Conditions	-40°C		25°C			85°C		Unit
				min	max	min	typ	max	min	max	
Output Voltage	V_{OL}	5.0	$V_{in} = V_{DD}$	-	0.05	-	0	0.05	-	0.05	V
		10		-	0.05	-	0	0.05	-	0.05	
		15		-	0.05	-	0	0.05	-	0.05	
	V_{OH}	5.0	$V_{in} = 0$	4.95	-	4.95	5.0	-	4.95	-	V
		10		9.95	-	9.95	10	-	9.95	-	
		15		14.95	-	14.95	15	-	14.95	-	
Input Voltage	V_{iL}	5.0	$V_{out} = 4.5V$	-	1.0	-	2.25	1.0	-	1.0	V
		10	$V_{out} = 9.0V$	-	2.0	-	4.50	2.0	-	2.0	
		15	$V_{out} = 13.5V$	-	2.5	-	6.75	2.5	-	2.5	
	V_{iH}	5.0	$V_{out} = 0.5V$	4.0	-	4.0	2.75	-	4.0	-	V
		10	$V_{out} = 1.0V$	8.0	-	8.0	5.50	-	8.0	-	
		15	$V_{out} = 1.5V$	12.5	-	12.5	8.25	-	12.5	-	
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	-	± 0.00001	± 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 $\pm I_{DD}$,	-	-	-	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	-	30	60	ns
		10	-	20	40	
		15	-	15	30	

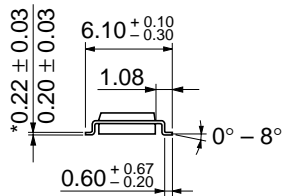
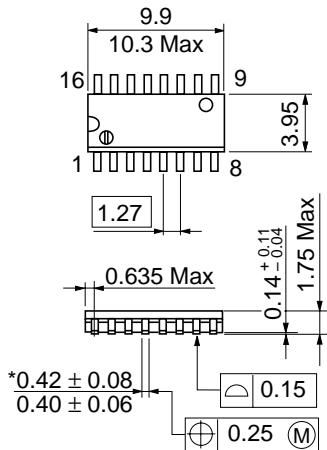


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



*Dimension including the plating thickness
 Base material dimension

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



*Dimension including the plating thickness
Base material dimension

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

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