HD14572UB

Hex Gate

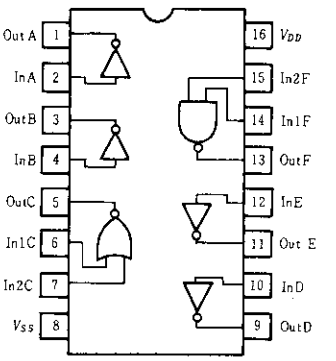
(4-Inverer
2-input NOR Gate
2-input NAND Gate)

The HD14572UB hex functional gate finds primary use where low power dissipation and/or high noise immunity is desired. The chip contains four inverters, one NOR gate and one NAND gate.

■ FEATURES

- Quiescent Current = 0.5nA/pkg typ. @5V
- Supply Voltage Range = 3 to 18V
- NOR Input Pin Adjacent to V_{SS} Pin to Simplify Use As An Inverter
- NAND Input Pin Adjacent to V_{DD} Pin to Simplify Use As An Inverter
- NOR Output Pin Adjacent to Inverter Input Pin For OR Application
- NAND Output Pin Adjacent to Inverter Input Pin For AND Application
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range

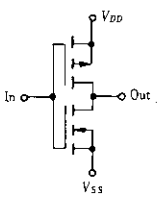
■ PIN ARRANGEMENT



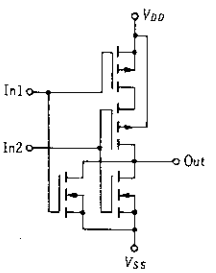
(Top View)

■ CIRCUIT SCHEMATIC

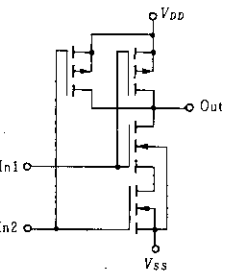
● Inverter



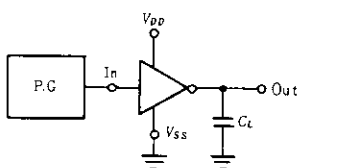
● NOR

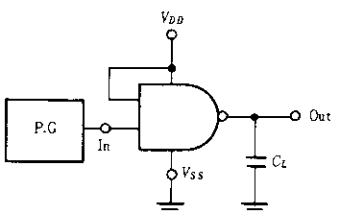


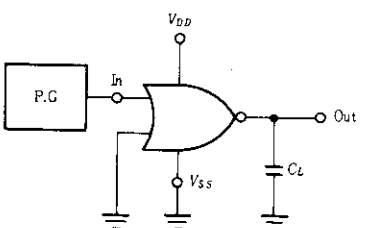
● NAND

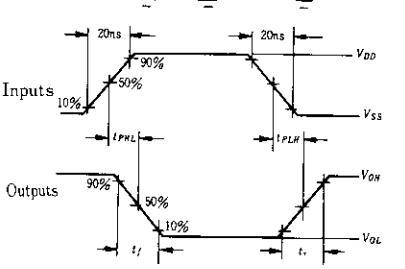


■ SWITCHING TIME TEST CIRCUIT









■ ELECTRICAL CHARACTERISTICS

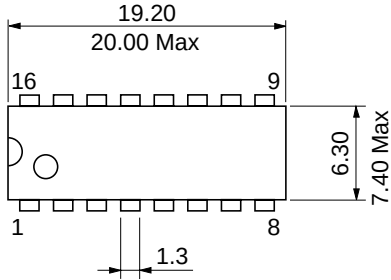
Characteristic	Symbol	V_{DD}(V)	Test Conditions	−40°C min	−40°C max	25°C min	25°C typ	25°C max	85°C min	85°C max	Unit
Output Voltage	V_{OL}	5.0	$V_{in}=V_{DD}$	—	0.05	—	0	0.05	—	0.05	V
		10		—	0.05	—	0	0.05	—	0.05	
		15		—	0.05	—	0	0.05	—	0.05	
	V_{OH}	5.0	$V_{in}=0$	4.95	—	4.95	5.0	—	4.95	—	V
		10		9.95	—	9.95	10	—	9.95	—	
		15		14.95	—	14.95	15	—	14.95	—	
Input Voltage	V_{IL}	5.0	$V_{out}=4.5$V	—	1.0	—	2.25	1.0	—	1.0	V
		10	$V_{out}=9.0$V	—	2.0	—	4.50	2.0	—	2.0	
		15	$V_{out}=13.5$V	—	2.5	—	6.75	2.5	—	2.5	
	V_{IH}	5.0	$V_{out}=0.5$V	4.0	—	4.0	2.75	—	4.0	—	V
		10	$V_{out}=1.0$V	8.0	—	8.0	5.50	—	8.0	—	
		15	$V_{out}=1.5$V	12.5	—	12.5	8.25	—	12.5	—	
Output Drive Current	I_{OH}	5.0	$V_{OH}=2.5$V	−1.0	—	−0.8	−1.7	—	−0.6	—	mA
		5.0	$V_{OH}=4.6$V	−0.2	—	−0.16	−0.36	—	−0.12	—	
		10	$V_{OH}=9.5$V	−0.5	—	−0.4	−0.9	—	−0.3	—	
		15	$V_{OH}=13.5$V	−1.4	—	−1.2	−3.5	—	−1.0	—	
	I_{OL}	5.0	$V_{OL}=0.4$V	0.52	—	0.44	0.88	—	0.36	—	mA
		10	$V_{OL}=0.5$V	1.3	—	1.1	2.25	—	0.9	—	
		15	$V_{OL}=1.5$V	3.6	—	3.0	8.8	—	2.4	—	
Input Current	I_{in}	15		—	±0.3	—	+0.00001	±0.3	—	±1.0	μA
Input Capacitance	C_{in}		$V_{in}=0$	—	—	—	5.0	7.5	—	—	pF
Quiescent Current	I_{DD}	5.0	Zero Signal, per Package	—	0.5	—	0.0005	0.5	—	3.8	μA
		10		—	1.0	—	0.0010	1.0	—	7.5	
		15		—	2.0	—	0.0015	2.0	—	15	
Total Supply Current*	I_T	5.0	Dynamic+I_{DD}, per Gate, $C_L=50$pF, $f=1$ kHz	—	—	—	1.89	—	—	—	μA
		10		—	—	—	3.80	—	—	—	
		15		—	—	—	5.68	—	—	—	

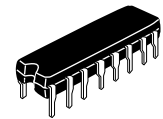
* To calculate total supply current at frequency other than 1kHz.
@$V_{DD}=5.0$V $I_T=(1.89\mu A/kHz)f+I_{DD}$, @$V_{DD}=10$V $I_T=(3.80\mu A/kHz)f+I_{DD}$, @$V_{DD}=15$V $I_T=(5.68\mu A/kHz)f+I_{DD}$

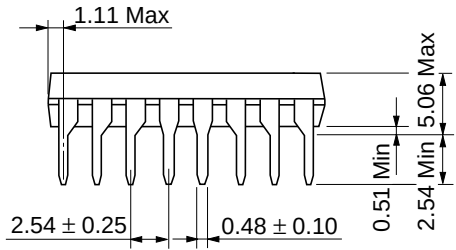
■ SWITCHING CHARACTERISTICS ($C_L=50$pF, $Ta=25$°C)

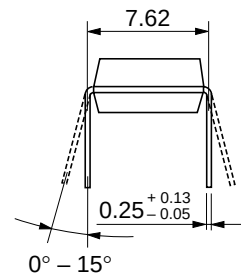
Characteristic	Symbol	V_{DD}(V)	min	typ	max	Unit
Output Rise Time	t_r	5.0	—	180	400	ns
		10	—	90	200	
		15	—	65	160	
Output Fall Time	t_f	5.0	—	100	200	ns
		10	—	50	100	
		15	—	37	80	
Propagation Delay Time	t_{PLH}	5.0	—	115	200	ns
		10	—	55	110	
		15	—	40	85	
	t_{PHL}	5.0	—	115	200	ns
		10	—	55	110	
		15	—	40	85	

Unit: mm



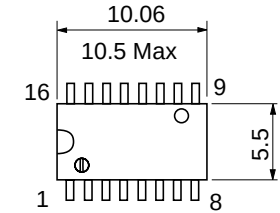


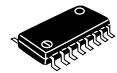


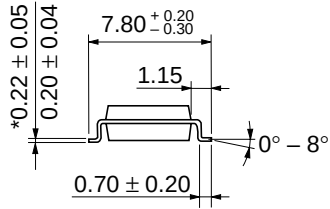


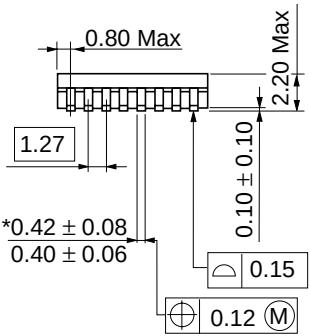
Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g

Unit: mm





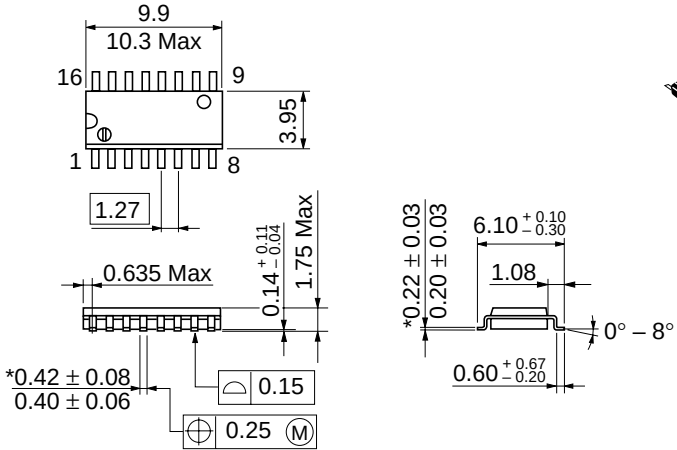




*Dimension including the plating thickness
Base material dimension

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

Unit: mm



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

*Dimension including the plating thickness
Base material dimension

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