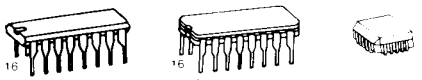
o46616 (367)
o46611 (368)

PRELIMINARY DATA

HEX BUS BUFFER (3-STATE)
HC367 NON-INVERTING
HC368 INVERTING

DESCRIPTION

The M54/74HC367 and the M54/74HC368 are high speed CMOS HEX BUS BUFFER (3-STATE) fabricated in silicon gate C²MOS technology. They have the same high speed performance of LSTTL combined with true CMOS low power consumption. These devices contain six buffers, four buffers are controlled by an enable input ($\overline{G1}$) and the other two buffers are controlled by the other enable input ($\overline{G2}$); the outputs of each buffer group are enabled when $\overline{G1}$ and/or $\overline{G2}$ inputs are held low, and when held high these outputs are disabled to be high-impedance.
These outputs are capable of driving up to 15 LSTTL loads. The designer has a choice of non-inverting outputs (HC367) and inverting outputs (HC368).
All inputs are equipped with protection circuits against static discharge or transient excess voltage.



B1	F1	C1
Plastic Package	Ceramic Package	Chip Carrier

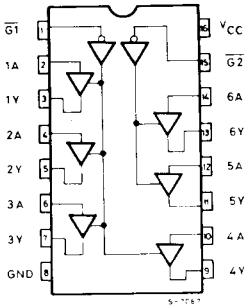
ORDERING NUMBERS: M54HCXXX F1
M74HCXXX B1
M74HCXXX F1
M74HCXXX C1

FEATURES

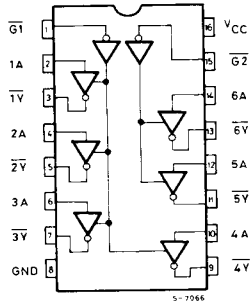
- High Speed
  t_{PD} = 10 ns (Typ.) at V_{CC} = 5V
- Low Power Dissipation
  I_{CC} = 4 μA (Max.) at T_A = 25°C
- High Noise Immunity
  $V_{NIH} = V_{NIL}$ = 28% V_{CC} (Min.)
- Output Drive Capability
  15 LSTTL Loads
- Symmetrical Output Impedance
  $|I_{OH}| = I_{OL}$ = 6 mA (Min.)
- Balanced Propagation Delays
  $t_{PLH} = t_{PHL}$
- Wide Operating Voltage Range
  V_{CC} (opr) = 2V to 6V
- Pin and Function compatible
  with 54/74LS367/368

PIN CONNECTIONS
(top view)

HC367

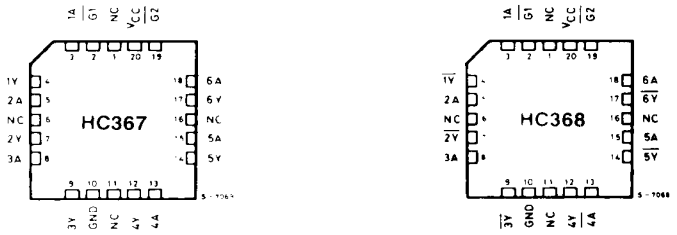


HC368



Dual in line

CHIP CARRIER



NC = No Internal Connection

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	− 0.5 to 7	V
V_I	DC Input Voltage	− 0.5 to V_{CC} + 0.5	V
V_O	DC Output Voltage	− 0.5 to V_{CC} + 0.5	V
I_{IK}	DC Input Diode Current	± 20	mA
I_{OK}	DC Output Diode Current	± 20	mA
I_O	DC Output Source Sink Current Per Output Pin	± 35	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	± 70	mA
P_D	Power Dissipation	500 (*)	mW
T_{stg}	Storage Temperature	− 65 to 150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

(*) 500 mW: ≅ 65°C derate to 300 mW by 10 mW/°C: 65°C to 85°C.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Limit	Unit
V_{CC}	Supply Voltage	2 to 6	V
V_I	Input Voltage	0 to V_{CC}	V
V_O	Output Voltage	0 to V_{CC}	V
T_A	Operating Temperature 74HC Series 54HC Series	− 40 to 85 − 55 to 125	°C
t_r, t_f	Input Rise and Fall Time	V_{CC} 2 V: 0 to 1000 V_{CC} 4.5V: 0 to 500 V_{CC} 6 V: 0 to 400	ns

DC SPECIFICATIONS

Symbol	Parameter	V_{CC}	Test Condition		T_A = 25°C 54HC and 74HC			−40 to 85°C 74HC		−55 to 125°C 54HC		Unit
					Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
V_{IH}	High Level Input Voltage	2.0			1.5	—	—	1.5	—	1.5	—	V
		4.5			3.15	—	—	3.15	—	3.15	—	
		6.0			4.2	—	—	4.2	—	4.2	—	
V_{IL}	Low Level Input Voltage	2.0			—	—	0.5	—	0.5	—	0.5	V
		4.5			—	—	1.35	—	1.35	—	1.35	
		6.0			—	—	1.8	—	1.8	—	1.8	
V_{OH}	High Level Output Voltage	2.0	V_I	I_O	1.9	2.0	—	1.9	—	1.9	—	V
		4.5	V_{IH} or V_{IL}	−20 μA	4.4	4.5	—	4.4	—	4.4	—	
		6.0			5.9	6.0	—	5.9	—	5.9	—	
		4.5		−6.0 mA	4.18	4.31	—	4.13	—	4.10	—	
		6.0		−7.8 mA	5.68	5.8	—	5.63	—	5.60	—	
V_{OL}	Low Level Output Voltage	2.0	V_{IH} or V_{IL}	20 μA	—	0	0.1	—	0.1	—	0.1	V
		4.5			—	0	0.1	—	0.1	—	0.1	
		6.0			—	0	0.1	—	0.1	—	0.1	
		4.5		6.0 mA	—	0.17	0.26	—	0.33	—	0.40	
		6.0		7.8 mA	—	0.18	0.26	—	0.33	—	0.40	
I_I	Input Leakage Current	6.0	V_I = V_{CC} or GND		—	—	±0.1	—	±1	—	±1	μA
I_{OZ}	3-State Output Off-State Current	6.0	V_I = V_{IH} or V_{IL} V_O = V_{CC} or GND		—	—	±0.5	—	±5.0	—	±10	μA
I_{CC}	Quiescent Supply Current	6.0	V_I = V_{CC} or GND I_O = 0		—	—	4	—	40	—	80	μA

AC ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, T_A = 25°C, Input $t_r = t_f$ = 6ns)

Symbol	Parameter	CL (pF)	54HC and 74HC			Unit
			MIN.	TYP.	MAX.	
t_{TLH} t_{THL}	Output Transition Time	50		7	11	ns
t_{PLH} t_{PHL}	Propagation Delay Time	50		10	17	ns
t_{PLZ} t_{PHZ}	State Output Enable Time	50		11	18	ns
t_{PZL} t_{PZH}	3-State Output Disable Time	5		14	23	ns

AC ELECTRICAL CHARACTERISTICS ($C_L = 50pF$, Input $t_r = t_f = 6ns$)

Symbol	Parameter	V_{CC}	Test Condition	T_A = 25°C 54HC and 74HC			−40 to 85°C 74HC		−55 to 125°C 54HC		Unit
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
t_{TLH} t_{THL}	Output Transition Time	2.0		—	22	60	—	75			ns
		4.5		—	8	12	—	15			
		6.0		—	7	10	—	13			
t_{PLH} t_{PHL}	Propagation Delay Time	2.0		—	55	90	—	110			ns
		4.5		—	11	18	—	22			
		6.0		—	10	16	—	19			
t_{PZL} t_{PZH}	Output Enable Time	2.0	$R_L = 1K\Omega$	—	60	100	—	120			ns
		4.5		—	12	20	—	24			
		6.0		—	11	17	—	21			
t_{PLZ} t_{PHZ}	Output Disable Time	2.0	$R_L = 1K\Omega$	—	63	121	—	146			ns
		4.5		—	20	29	—	34			
		6.0		—	18	26	—	30			
C_{IN}	Input Capacitance			—	5	10	—	10			pF
C_{OUT}	Output Capacitance			—	10	—	—	—			
C_{PD} (*)	Power Dissipation Capacitance		HC 367	—	34	—	—	—			pF
			HC 368	—	32	—	—	—			

Note (*) C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the following equation.
$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}/6$ (per circuit).