## DATA SHEET

For a complete data sheet, please also download:

- The IC06 74HC/HCT/HCU/HCMOS Logic Family Specifications
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Information
- The IC06 74HC/HCT/HCU/HCMOS Logic Package Outlines

74HC/HCT4351 8-channel analog multiplexer/demultiplexer with latch

File under Integrated Circuits, IC06

## 8-channel analog multiplexer/demultiplexer with latch

## 74HC/HCT4351

## FEATURES

- Wide analog input voltage range: $\pm 5 \mathrm{~V}$
- Low "ON" resistance:
$80 \Omega$ (typ.) at $\mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}=4.5 \mathrm{~V}$
$70 \Omega$ (typ.) at $\mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}=6.0 \mathrm{~V}$
$60 \Omega$ (typ.) at $\mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}=9.0 \mathrm{~V}$
- Logic level translation: to enable 5 V logic to communicate with $\pm 5 \mathrm{~V}$ analog signals
- Typical "break before make" built in
- Address latches provided
- Output capability: non-standard
- I ${ }_{\text {CC }}$ category: MSI


## GENERAL DESCRIPTION

The $74 \mathrm{HC} / \mathrm{HCT} 4351$ are high-speed Si-gate CMOS devices. They are specified in compliance with JEDEC standard no. 7A.

The $74 \mathrm{HC} / \mathrm{HCT} 4351$ are 8-channel analog multiplexers/demultiplexers with three select inputs ( $\mathrm{S}_{0}$ to $S_{2}$ ), two enable inputs ( $\bar{E}_{1}$ and $E_{2}$ ), a latch enable input $(\overline{L E})$, eight independent inputs/outputs $\left(Y_{0}\right.$ to $\left.Y_{7}\right)$ and a common input/output (Z).

With $\bar{E}_{1}$ LOW and $E_{2}$ is HIGH , one of the eight switches is selected (low impedance ON-state) by $\mathrm{S}_{0}$ to $\mathrm{S}_{2}$. The data at the select inputs may be latched by using the active LOW latch enable input ( $\overline{\mathrm{LE}})$. When $\overline{\mathrm{LE}}$ is HIGH the latch is transparent. When either of the two enable inputs, $\overline{\mathrm{E}}_{1}$ (active LOW) and $\mathrm{E}_{2}$ (active HIGH), is inactive, all 8 analog switches are turned off.
$\mathrm{V}_{C C}$ and GND are the supply voltage pins for the digital control inputs ( $\mathrm{S}_{0}$ to $\mathrm{S}_{2}, \overline{\mathrm{LE}}, \overline{\mathrm{E}}_{1}$ and $\mathrm{E}_{2}$ ). The $\mathrm{V}_{\mathrm{CC}}$ to GND ranges are 2.0 to 10.0 V for HC and 4.5 to 5.5 V for HCT. The analog inputs/outputs ( $\mathrm{Y}_{0}$ to $\mathrm{Y}_{7}$, and Z ) can swing between $\mathrm{V}_{\mathrm{CC}}$ as a positive limit and $\mathrm{V}_{\mathrm{EE}}$ as a negative limit.
$\mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}$ may not exceed 10.0 V .
For operation as a digital multiplexer/demultiplexer, $\mathrm{V}_{\mathrm{EE}}$ is connected to GND (typically ground).

## QUICK REFERENCE DATA

$\mathrm{V}_{\mathrm{EE}}=\mathrm{GND}=0 \mathrm{~V} ; \mathrm{T}_{\mathrm{amb}}=25^{\circ} \mathrm{C} ; \mathrm{t}_{\mathrm{r}}=\mathrm{t}_{\mathrm{f}}=6 \mathrm{~ns}$

| SYMBOL | PARAMETER | CONDITIONS | TYPICAL |  | UNIT |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | HC | HCT |  |
| $\mathrm{t}_{\text {PZH }} / \mathrm{t}_{\text {PZL }}$ | turn "ON" time $\overline{\mathrm{E}}_{1}$, $\mathrm{E}_{2}$ or $\mathrm{S}_{\mathrm{n}}$ to $\mathrm{V}_{\text {os }}$ | $\mathrm{C}_{\mathrm{L}}=15 \mathrm{pF} ; \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \mathrm{V}_{\mathrm{CC}}=5 \mathrm{~V}$ | 27 | 35 | ns |
| $\mathrm{t}_{\text {PHZ }} / \mathrm{t}_{\text {PLZ }}$ | turn "OFF" time $\overline{\mathrm{E}}_{1}$, $\mathrm{E}_{2}$ or $\mathrm{S}_{\mathrm{n}}$ to $\mathrm{V}_{\text {os }}$ |  | 21 | 23 | ns |
| $\mathrm{C}_{1}$ | input capacitance |  | 3.5 | 3.5 | pF |
| $\mathrm{C}_{\text {PD }}$ | power dissipation capacitance per switch | notes 1 and 2 | 25 | 25 | pF |
| $\mathrm{C}_{S}$ | max. switch capacitance independent ( Y ) common (Z) |  | $\begin{aligned} & 5 \\ & 25 \end{aligned}$ | $\begin{aligned} & 5 \\ & 25 \end{aligned}$ | $\begin{aligned} & \mathrm{pF} \\ & \mathrm{pF} \end{aligned}$ |

## Notes

1. $\mathrm{C}_{P D}$ is used to determine the dynamic power dissipation ( $P_{D}$ in $\mu W$ ):
$P_{D}=C_{P D} \times V_{C C}^{2} \times f_{i}+\sum\left\{\left(C_{L}+C_{S}\right) \times V_{C C}{ }^{2} \times f_{o}\right\}$ where:
$\mathrm{f}_{\mathrm{i}}=$ input frequency in MHz
$\mathrm{f}_{\mathrm{o}}=$ output frequency in MHz
$\mathrm{C}_{\mathrm{L}}=$ output load capacitance in pF
$\mathrm{C}_{\mathrm{S}}=$ max. switch capacitance in pF
$\Sigma\left\{\left(C_{L}+C_{S}\right) \times V_{C C}{ }^{2} \times f_{0}\right\}=$ sum of outputs
$\mathrm{V}_{\mathrm{CC}}=$ supply voltage in V
2. For HC the condition is $\mathrm{V}_{\mathrm{I}}=\mathrm{GND}$ to $\mathrm{V}_{\mathrm{CC}}$

For HCT the condition is $\mathrm{V}_{\mathrm{I}}=\mathrm{GND}$ to $\mathrm{V}_{\mathrm{CC}}-1.5 \mathrm{~V}$

## ORDERING INFORMATION

See "74HC/HCT/HCU/HCMOS Logic Package Information".

## 8-channel analog multiplexer/demultiplexer with latch

## PIN DESCRIPTION

| PIN NO. | SYMBOL | NAME AND FUNCTION |
| :--- | :--- | :--- |
| 4 | Z | common |
| 3,14 | n.c. | not connected |
| 7 | $\overline{\mathrm{E}}_{1}$ | enable input (active LOW) |
| 8 | $\mathrm{E}_{2}$ | enable input (active HIGH) |
| 9 | $\mathrm{~V}_{\mathrm{EE}}$ | negative supply voltage |
| 10 | GND | ground (0 V) |
| 11 | $\overline{\mathrm{LE}}$ | latch enable input (active LOW) |
| $15,13,12$ | $\mathrm{~S}_{0}$ to $\mathrm{S}_{2}$ | select inputs |
| $17,18,19,16,1,6,2,5$ | $\mathrm{Y}_{0}$ to $\mathrm{Y}_{7}$ | independent inputs/outputs |
| 20 | $\mathrm{~V}_{\mathrm{CC}}$ | positive supply voltage |



Fig. 1 Pin configuration.


Fig. 2


Fig. 3 IEC logic symbol.

8-channel analog multiplexer/demultiplexer with latch

FUNCTION TABLE

| INPUTS |  |  |  |  |  | CHANNEL ON |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\bar{E}_{1}$ | $\mathrm{E}_{2}$ | $\overline{\text { LE }}$ | $\mathrm{S}_{2}$ | $\mathrm{S}_{1}$ | $\mathrm{S}_{0}$ |  |
| H | X | X | X | X | X | none |
| X | L | X | X | X | X | none |
| L | H | H | L | L | L | $Y_{0}$ |
| L | H | H | L | L | H | $Y_{1}$ |
| L | H | H | L | H | L | $\mathrm{Y}_{2}$ |
| L | H | H | L | H | H | $Y_{3}$ |
| L | H | H | H | L | L | $Y_{4}$ |
| L | H | H | H | L | H | $Y_{5}$ |
| L | H | H | H | H | L | $\mathrm{Y}_{6}$ |
| L | H | H | H | H | H | $\mathrm{Y}_{7}$ |
| L | H | L | X | x | X | (1) |
| X | X | $\downarrow$ | x | x | X | (2) |

## Notes

1. Last selected channel "ON".
2. Selected channels latched.
3. $\mathrm{H}=\mathrm{HIGH}$ voltage level

L = LOW voltage level
X = don't care
$\downarrow=$ HIGH-to-LOW $\overline{\text { LE }}$ transition

## APPLICATIONS

- Analog multiplexing and demultiplexing
- Digital multiplexing and demultiplexing
- Signal gating


Fig. 4 Functional diagram.


Fig. 5 Schematic diagram (one switch).

## 8-channel analog multiplexer/demultiplexer with latch

## RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)
Voltages are referenced to $\mathrm{V}_{\mathrm{EE}}=\mathrm{GND}$ (ground $=0 \mathrm{~V}$ )

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT | CONDITIONS |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{V}_{\text {CC }}$ | DC supply voltage | -0.5 | +11.0 | V |  |
| $\pm \mathrm{I}_{\text {IK }}$ | DC digital input diode current |  | 20 | mA | for $\mathrm{V}_{1}<-0.5 \mathrm{~V}$ or $\mathrm{V}_{1}>\mathrm{V}_{\mathrm{CC}}+0.5 \mathrm{~V}$ |
| $\pm \mathrm{l}_{\text {SK }}$ | DC switch diode current |  | 20 | mA | for $\mathrm{V}_{\mathrm{S}}<-0.5 \mathrm{~V}$ or $\mathrm{V}_{\mathrm{S}}>\mathrm{V}_{\mathrm{CC}}+0.5 \mathrm{~V}$ |
| $\pm \mathrm{l}_{\text {S }}$ | DC switch current |  | 25 | mA | for $-0.5 \mathrm{~V}<\mathrm{V}_{\mathrm{S}}<\mathrm{V}_{\mathrm{CC}}+0.5 \mathrm{~V}$ |
| $\pm \mathrm{I}_{\text {EE }}$ | DC V $\mathrm{EEE}^{\text {current }}$ |  | 20 | mA |  |
| $\pm \mathrm{l}_{\mathrm{CC} ;} \pm \mathrm{l}_{\mathrm{GND}}$ | DC V ${ }_{\text {cc }}$ or GND current |  | 50 | mA |  |
| $\mathrm{T}_{\text {stg }}$ | storage temperature range | -65 | +150 | ${ }^{\circ} \mathrm{C}$ |  |
| $\mathrm{P}_{\text {tot }}$ | power dissipation per package <br> plastic DIL |  | 750 | mW | for temperature range: -40 to $+125^{\circ} \mathrm{C}$ 74HC/HCT <br> above $+70^{\circ} \mathrm{C}$ : derate linearly with $12 \mathrm{~mW} / \mathrm{K}$ |
|  | plastic mini-pack (SO) |  | 500 | mW | above $+70^{\circ} \mathrm{C}$ : derate linearly with $8 \mathrm{~mW} / \mathrm{K}$ |
| $\mathrm{P}_{S}$ | power dissipation per switch |  | 100 | mW |  |

## Note to ratings

1. To avoid drawing $V_{C C}$ current out of terminal $Z$, when switch current flows in terminals $Y_{n}$, the voltage drop across the bidirectional switch must not exceed 0.4 V . If the switch current flows into terminal Z , no $\mathrm{V}_{\mathrm{cc}}$ current will flow out of terminals $Y_{n}$. In this case there is no limit for the voltage drop across the switch, but the voltages at $Y_{n}$ and $Z$ may not exceed $\mathrm{V}_{\mathrm{CC}}$ or $\mathrm{V}_{\mathrm{EE}}$.

## RECOMMENDED OPERATING CONDITIONS

| SYMBOL | PARAMETER | 74HC |  |  | 74HCT |  |  | UNIT | CONDITIONS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | min. | typ. | max. | min. | typ. | max. |  |  |
| $\mathrm{V}_{\text {CC }}$ | DC supply voltage $\mathrm{V}_{\mathrm{CC}}-\mathrm{GND}$ | 2.0 | 5.0 | 10.0 | 4.5 | 5.0 | 5.5 | V | see Figs 6 and 7 |
| $\mathrm{V}_{\text {CC }}$ | DC supply voltage $\mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}$ | 2.0 | 5.0 | 10.0 | 2.0 | 5.0 | 10.0 | V | see Figs 6 and 7 |
| $V_{1}$ | DC input voltage range | GND |  | $\mathrm{V}_{\mathrm{CC}}$ | GND |  | $\mathrm{V}_{\mathrm{CC}}$ | V |  |
| $\mathrm{V}_{\mathrm{S}}$ | DC switch voltage range | $\mathrm{V}_{\mathrm{EE}}$ |  | $\mathrm{V}_{\mathrm{CC}}$ | $\mathrm{V}_{\mathrm{EE}}$ |  | $\mathrm{V}_{\mathrm{CC}}$ | V |  |
| $\mathrm{T}_{\text {amb }}$ | operating ambient temperature range | -40 |  | +85 | -40 |  | +85 | ${ }^{\circ} \mathrm{C}$ | DC |
| $\mathrm{T}_{\text {amb }}$ | operating ambient temperature range | -40 |  | +125 | -40 |  | +125 | ${ }^{\circ} \mathrm{C}$ | CHARACTERISTICS |
| $\mathrm{tr}_{\mathrm{r}}, \mathrm{t}_{\mathrm{f}}$ | input rise and fall times |  | 6.0 | $\begin{aligned} & 1000 \\ & 500 \\ & 400 \\ & 250 \end{aligned}$ |  | 6.0 | 500 | ns | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}}=2.0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=4.5 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=6.0 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CC}}=10.0 \mathrm{~V} \end{aligned}$ |

## 8-channel analog multiplexer/demultiplexer with latch

## 74HC/HCT4351



Fig. 6 Guaranteed operating area as a function of the supply voltages for 74 HC 4351 .


Fig. 7 Guaranteed operating area as a function of the supply voltages for 74 HCT 4351 .

DC CHARACTERISTICS FOR 74HC/HCT
For $74 \mathrm{HC}: \quad \mathrm{V}_{\mathrm{CC}}-\mathrm{GND}$ or $\mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}=2.0,4.5,6.0$ and 9.0 V
For $74 \mathrm{HCT}: \mathrm{V}_{\mathrm{CC}}-\mathrm{GND}=4.5$ and $5.5 \mathrm{~V} ; \mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}=2.0,4.5,6.0$ and 9.0 V

| SYMBOL | PARAMETER | Tamb $\left(^{\circ} \mathrm{C}\right.$ ) |  |  |  |  |  |  | UNIT | TEST CONDITIONS |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 74HC/HCT |  |  |  |  |  |  |  | $V_{c c}$ <br> (V) | $\mathrm{V}_{\mathrm{EE}}$ <br> (V) | $\begin{gathered} \mathbf{I}_{\mathbf{S}} \\ (\mu \mathrm{A}) \end{gathered}$ | $\mathrm{V}_{\text {is }}$ | $\mathrm{V}_{1}$ |
|  |  | +25 |  |  | -40 to +85 |  | $\begin{gathered} -40 \text { to } \\ +125 \end{gathered}$ |  |  |  |  |  |  |  |
|  |  | min. | typ. | max. | min. | max. | min. | max. |  |  |  |  |  |  |
| $\mathrm{R}_{\text {ON }}$ | ON resistance (rail) |  | $\begin{aligned} & 100 \\ & 90 \\ & 70 \end{aligned}$ | $\begin{aligned} & 180 \\ & 160 \\ & 130 \end{aligned}$ |  | $\begin{aligned} & 225 \\ & 200 \\ & 165 \end{aligned}$ |  | $\begin{aligned} & 270 \\ & 240 \\ & 195 \end{aligned}$ | $\begin{aligned} & \Omega \\ & \Omega \\ & \Omega \\ & \Omega \end{aligned}$ | $\begin{array}{\|l} \hline 2.0 \\ 4.5 \\ 6.0 \\ 4.5 \end{array}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{array}{\|l\|} \hline 100 \\ 1000 \\ 1000 \\ 1000 \end{array}$ | $V_{C C}$ to $\mathrm{V}_{\mathrm{EE}}$ | $V_{\text {IN }}$ or VIL |
| $\mathrm{R}_{\mathrm{ON}}$ | ON resistance (rail) |  | $\begin{array}{\|l\|} \hline 150 \\ 80 \\ 70 \\ 60 \end{array}$ | $\begin{aligned} & - \\ & 140 \\ & 120 \\ & 105 \end{aligned}$ |  | $\begin{aligned} & - \\ & 175 \\ & 150 \\ & 130 \end{aligned}$ |  | $\begin{aligned} & - \\ & 210 \\ & 180 \\ & 160 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline \Omega \\ & \Omega \\ & \Omega \\ & \Omega \end{aligned}$ | $\begin{array}{\|l\|} \hline 2.0 \\ 4.5 \\ 6.0 \\ 4.5 \end{array}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{array}{\|l\|} \hline 100 \\ 1000 \\ 1000 \\ 1000 \end{array}$ | $\mathrm{V}_{\mathrm{EE}}$ | $\mathrm{V}_{\mathrm{IH}}$ <br> or $\mathrm{V}_{\mathrm{IL}}$ |
| $\mathrm{R}_{\text {ON }}$ | ON resistance (rail) |  | $\begin{array}{\|l\|} \hline 150 \\ 90 \\ 80 \\ 65 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline- \\ 160 \\ 140 \\ 120 \\ \hline \end{array}$ |  | $\begin{array}{\|l\|} \hline- \\ 200 \\ 175 \\ 150 \end{array}$ |  | $\begin{array}{\|l} \hline- \\ 240 \\ 210 \\ 180 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \Omega \\ \Omega \\ \Omega \\ \Omega \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 2.0 \\ 4.5 \\ 6.0 \\ 4.5 \\ \hline \end{array}$ | $\begin{array}{\|l} 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{array}{\|l\|} \hline 100 \\ 1000 \\ 1000 \\ 1000 \\ \hline \end{array}$ | $\mathrm{V}_{\mathrm{CC}}$ | $\mathrm{V}_{\mathrm{IH}}$ <br> or <br> $\mathrm{V}_{\mathrm{IL}}$ |
| $\Delta \mathrm{R}_{\mathrm{ON}}$ | maximum $\Delta \mathrm{ON}$ resistance between any two channels |  | - 9 8 6 |  |  |  |  |  | $\begin{aligned} & \hline \Omega \\ & \Omega \\ & \Omega \\ & \Omega \end{aligned}$ | $\begin{array}{\|l\|} \hline 2.0 \\ 4.5 \\ 6.0 \\ 4.5 \end{array}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ |  | $\begin{aligned} & \mathrm{V}_{\mathrm{CC}} \\ & \text { to } \\ & \mathrm{V}_{\mathrm{EE}} \end{aligned}$ | $\mathrm{V}_{\mathrm{IH}}$ <br> or <br> $\mathrm{V}_{\mathrm{IL}}$ |

## Notes to DC characteristics

1. At supply voltages $\left(\mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}}\right)$ approaching 2.0 V , the analog switch ON -resistance becomes extremely non-linear. There it is recommended that these devices be used to transmit digital signals only, when using these supply voltages.
2. For test circuit measuring $\mathrm{R}_{\mathrm{ON}}$ see Fig.8.

## 8-channel analog multiplexer/demultiplexer with latch

## 74HC/HCT4351

## DC CHARACTERISTICS FOR 74HC

Voltages are referenced to GND (ground = 0 V )

| SYMBOL | PARAMETER | Tamb $\left({ }^{\circ} \mathrm{C}\right)$ |  |  |  |  |  |  | UNIT | TEST CONDITIONS |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 74HC |  |  |  |  |  |  |  | $\mathrm{V}_{\mathrm{cc}}$ <br> (V) | $\begin{aligned} & \mathrm{V}_{\mathrm{EE}} \\ & (\mathrm{~V}) \end{aligned}$ | $\mathrm{V}_{1}$ | OTHER |
|  |  | +25 |  |  | -40 to +85 |  | -40 to +125 |  |  |  |  |  |  |
|  |  | min. | typ. | max. | min. | max. | min. | max. |  |  |  |  |  |
| $\mathrm{V}_{\mathrm{IH}}$ | HIGH level input voltage | $\begin{array}{\|l\|} \hline 1.5 \\ 3.15 \\ 4.2 \\ 6.3 \end{array}$ | $\begin{aligned} & \hline 1.2 \\ & 2.4 \\ & 3.2 \\ & 4.7 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 1.5 \\ 3.15 \\ 4.2 \\ 6.3 \end{array}$ |  | $\begin{aligned} & \hline 1.5 \\ & 3.15 \\ & 4.2 \\ & 6.3 \end{aligned}$ |  | V | $\begin{aligned} & 2.0 \\ & 4.5 \\ & 6.0 \\ & 9.0 \end{aligned}$ |  |  |  |
| $\mathrm{V}_{\mathrm{IL}}$ | LOW level input voltage |  | $\begin{aligned} & 0.8 \\ & 2.1 \\ & 2.8 \\ & 4.8 \end{aligned}$ | $\begin{aligned} & \hline 0.5 \\ & 1.35 \\ & 1.8 \\ & 2.7 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 0.5 \\ 1.35 \\ 1.8 \\ 2.7 \end{array}$ |  | $\begin{aligned} & \hline 0.5 \\ & 1.35 \\ & 1.8 \\ & 2.7 \end{aligned}$ | V | $\begin{aligned} & 2.0 \\ & 4.5 \\ & 6.0 \\ & 9.0 \end{aligned}$ |  |  |  |
| $\pm 1$ | input leakage current |  |  | $\begin{aligned} & 0.1 \\ & 0.2 \end{aligned}$ |  | $\begin{aligned} & 1.0 \\ & 2.0 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 1.0 \\ 2.0 \end{array}$ | $\mu \mathrm{A}$ | $\begin{aligned} & 6.0 \\ & 10.0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $\mathrm{V}_{\mathrm{CC}}$ or GND |  |
| $\pm \mathrm{l}_{\text {S }}$ | analog switch OFF-state current per channel |  |  | 0.1 |  | 1.0 |  | 1.0 | $\mu \mathrm{A}$ | 10.0 | 0 | $\mathrm{V}_{\mathrm{IH}}$ <br> or $\mathrm{V}_{\text {IL }}$ | $\begin{array}{\|l} \hline \mathrm{V}_{\mathrm{S}} \mid= \\ \mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}} \\ \text { (see Fig.10) } \\ \hline \end{array}$ |
| $\pm \mathrm{l}_{\text {S }}$ | analog switch OFF-state current all channels |  |  | 0.4 |  | 4.0 |  | 4.0 | $\mu \mathrm{A}$ | 10.0 | 0 | $\mathrm{V}_{\mathrm{IH}}$ <br> or $\mathrm{V}_{\mathrm{IL}}$ | $\begin{aligned} & \hline \mathrm{V}_{\mathrm{S}} \mathrm{I}= \\ & \mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}} \\ & \text { (see Fig.10) } \end{aligned}$ |
| $\pm \mathrm{l}_{\mathrm{S}}$ | analog switch ON-state current |  |  | 0.4 |  | 4.0 |  | 4.0 | $\mu \mathrm{A}$ | 10.0 | 0 | $\mathrm{V}_{\mathrm{IH}}$ <br> or $\mathrm{V}_{\mathrm{IL}}$ | $\begin{aligned} & \hline \mathrm{V}_{\mathrm{S}} \mathrm{I}^{2} \\ & \mathrm{~V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}} \\ & \text { (see Fig.11) } \end{aligned}$ |
| $\mathrm{I}_{\mathrm{CC}}$ | quiescent supply current |  |  | $\begin{aligned} & 8.0 \\ & 16.0 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 80.0 \\ 160.0 \end{array}$ |  | $\begin{aligned} & 160.0 \\ & 320.0 \end{aligned}$ | $\mu \mathrm{A}$ | $\begin{aligned} & \hline 6.0 \\ & 10.0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $\mathrm{V}_{\mathrm{CC}}$ or GND | $\begin{aligned} & \mathrm{V}_{\text {is }}=\mathrm{V}_{\mathrm{EE}} \\ & \text { or } \mathrm{V}_{\mathrm{CC}} ; \\ & \mathrm{V}_{\mathrm{OS}}=\mathrm{V}_{\mathrm{CC}} \\ & \text { or } \mathrm{V}_{\mathrm{EE}} \end{aligned}$ |

## 8-channel analog multiplexer/demultiplexer with latch

AC CHARACTERISTICS FOR 74HC
GND $=0 \mathrm{~V} ; \mathrm{t}_{\mathrm{r}}=\mathrm{t}_{\mathrm{f}}=6 \mathrm{~ns} ; \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$

| SYMBOL | PARAMETER | $\mathrm{T}_{\text {amb }}\left({ }^{\circ} \mathrm{C}\right.$ ) |  |  |  |  |  |  | UNIT | TEST CONDITIONS |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 74HC |  |  |  |  |  |  |  | $\begin{aligned} & \mathrm{v}_{\mathrm{cc}} \\ & \text { (V) } \end{aligned}$ | $\begin{aligned} & \mathrm{V}_{\mathrm{EE}} \\ & (\mathrm{~V}) \end{aligned}$ | OTHER |
|  |  | +25 |  |  | -40 to +85 |  | -40 to +125 |  |  |  |  |  |
|  |  | min. | typ. | max. | min. | max. | min. | max. |  |  |  |  |
| tPHL/ $\mathrm{t}_{\text {PLH }}$ | $\begin{aligned} & \text { propagation delay } \\ & \mathrm{V}_{\text {is }} \text { to } \mathrm{V}_{\text {os }} \end{aligned}$ |  | $\begin{aligned} & \hline 14 \\ & 5 \\ & 4 \\ & 4 \end{aligned}$ | $\begin{aligned} & \hline 60 \\ & 12 \\ & 10 \\ & 8 \end{aligned}$ |  | $\begin{aligned} & \hline 75 \\ & 15 \\ & 13 \\ & 10 \end{aligned}$ |  | $\begin{aligned} & 90 \\ & 18 \\ & 15 \\ & 12 \end{aligned}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{aligned} & R_{L}=\infty ; \\ & C_{L}=50 \mathrm{pF} \\ & \text { (see Fig.17) } \end{aligned}$ |
| tpzH/ tpzL | $\begin{aligned} & \text { turn "ON" time } \\ & \overline{\mathrm{E}}_{1} \text { to } \mathrm{V}_{\mathrm{os}} \end{aligned}$ |  | $\begin{aligned} & \hline 85 \\ & 31 \\ & 25 \\ & 28 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 300 \\ 60 \\ 51 \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{\|l} \hline 375 \\ 75 \\ 64 \\ 69 \\ \hline \end{array}$ |  | $\begin{array}{\|l\|} \hline 450 \\ 90 \\ 77 \\ 83 \end{array}$ | ns | $\begin{aligned} & 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PzH }} / \mathrm{t}_{\text {PzL }}$ | $\begin{array}{\|l} \hline \text { turn "ON" time } \\ \mathrm{E}_{2} \text { to } \mathrm{V}_{\mathrm{os}} \end{array}$ |  | $\begin{array}{\|l\|} \hline 85 \\ 31 \\ 25 \\ 25 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 300 \\ 60 \\ 51 \\ 55 \\ \hline \end{array}$ |  | $\begin{array}{\|l} \hline 375 \\ 75 \\ 64 \\ 69 \\ \hline \end{array}$ |  | $\begin{array}{\|l\|} \hline 450 \\ 90 \\ 77 \\ 83 \\ \hline \end{array}$ | ns | 2.0 4.5 6.0 4.5 | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| tpzH/ tpzL | turn "ON" time $\overline{\mathrm{LE}}$ to $\mathrm{V}_{\mathrm{os}}$ |  | $\begin{aligned} & 91 \\ & 33 \\ & 26 \\ & 27 \end{aligned}$ | $\begin{aligned} & \hline 300 \\ & 60 \\ & 51 \\ & 55 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 375 \\ 75 \\ 64 \\ 69 \end{array}$ |  | $\begin{array}{\|l} \hline 450 \\ 90 \\ 77 \\ 83 \end{array}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| tPzH/ tPZL | $\begin{aligned} & \text { turn "ON" time } \\ & \mathrm{S}_{\mathrm{n}} \text { to } \mathrm{V}_{\mathrm{os}} \end{aligned}$ |  | $\begin{aligned} & 88 \\ & 32 \\ & 26 \\ & 25 \end{aligned}$ | $\begin{aligned} & \hline 300 \\ & 60 \\ & 51 \\ & 50 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 375 \\ 75 \\ 64 \\ 63 \end{array}$ |  | $\begin{array}{\|l\|} \hline 450 \\ 90 \\ 77 \\ 75 \end{array}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PHZ }} / \mathrm{t}_{\text {PLZ }}$ | $\begin{aligned} & \text { turn "OFF" time } \\ & \overline{\mathrm{E}}_{1} \text { to } \mathrm{V}_{\text {os }} \end{aligned}$ |  | $\begin{aligned} & 69 \\ & 25 \\ & 20 \\ & 20 \end{aligned}$ | $\begin{array}{\|l\|} \hline 250 \\ 50 \\ 43 \\ 40 \end{array}$ |  | $\begin{aligned} & \hline 315 \\ & 63 \\ & 54 \\ & 50 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 375 \\ 75 \\ 64 \\ 60 \end{array}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PHZ }} / \mathrm{t}_{\text {PLZ }}$ | turn "OFF" time $\mathrm{E}_{2}$ to $\mathrm{V}_{\text {os }}$ |  | $\begin{aligned} & \hline 72 \\ & 26 \\ & 21 \\ & 19 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 250 \\ 50 \\ 43 \\ 40 \\ \hline \end{array}$ |  | $\begin{aligned} & \hline 315 \\ & 63 \\ & 54 \\ & 50 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 375 \\ 75 \\ 64 \\ 60 \\ \hline \end{array}$ | ns | $\begin{array}{\|l\|} \hline 2.0 \\ 4.5 \\ 6.0 \\ 4.5 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig. } 18 \text { ) } \end{aligned}$ |
| $\mathrm{t}_{\text {PHZ }} / \mathrm{t}_{\text {PLZ }}$ | $\begin{aligned} & \text { turn "OFF" time } \\ & \overline{\mathrm{LE}} \text { to } \mathrm{V}_{\text {os }} \end{aligned}$ |  | $\begin{aligned} & 83 \\ & 30 \\ & 24 \\ & 26 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 275 \\ 55 \\ 47 \\ 45 \\ \hline \end{array}$ |  | $\begin{aligned} & \hline 345 \\ & 69 \\ & 59 \\ & 56 \\ & \hline \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 415 \\ 83 \\ 71 \\ 68 \end{array}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| tpHz/ tpLZ | $\begin{aligned} & \text { turn "OFF" time } \\ & \mathrm{S}_{\mathrm{n}} \text { to } \mathrm{V}_{\text {os }} \end{aligned}$ |  | $\begin{aligned} & 80 \\ & 29 \\ & 23 \\ & 24 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline 275 \\ 55 \\ 47 \\ 48 \\ \hline \end{array}$ |  | $\begin{array}{\|l\|} \hline 345 \\ 69 \\ 59 \\ 60 \\ \hline \end{array}$ |  | $\begin{array}{\|l\|} \hline 415 \\ 83 \\ 71 \\ 72 \\ \hline \end{array}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |

8-channel analog multiplexer/demultiplexer with latch

| SYMBOL | PARAMETER | Tamb ( ${ }^{\circ} \mathrm{C}$ ) |  |  |  |  |  |  | UNIT | TEST CONDITIONS |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 74HC |  |  |  |  |  |  |  | $V_{c c}$ <br> (V) | $\mathrm{V}_{\mathrm{EE}}$ <br> (V) | OTHER |
|  |  | +25 |  |  | -40 to +85 |  | -40 to +125 |  |  |  |  |  |
|  |  | min. | typ. | max. | min. | max. | min. | max. |  |  |  |  |
| $\mathrm{t}_{\text {su }}$ | set-up time $S_{n}$ to $\overline{\mathrm{LE}}$ | $\begin{aligned} & \hline 60 \\ & 12 \\ & 10 \\ & 18 \end{aligned}$ | $\begin{aligned} & \hline 17 \\ & 6 \\ & 5 \\ & 9 \end{aligned}$ |  |  | $\begin{aligned} & \hline 75 \\ & 15 \\ & 13 \\ & 23 \end{aligned}$ |  | $\begin{aligned} & 90 \\ & 18 \\ & 15 \\ & 27 \end{aligned}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig. } 19 \text { ) } \end{aligned}$ |
| $\mathrm{t}_{\mathrm{h}}$ | hold time $S_{n}$ to $\overline{\mathrm{LE}}$ | $\begin{aligned} & 5 \\ & 5 \\ & 5 \\ & 5 \end{aligned}$ | $\begin{aligned} & -8 \\ & -3 \\ & -2 \\ & -4 \end{aligned}$ |  |  | 5 5 5 5 |  | $\begin{aligned} & 5 \\ & 5 \\ & 5 \\ & 5 \end{aligned}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.19) } \end{aligned}$ |
| tw | $\overline{\mathrm{LE}}$ minimum pulse width HIGH | $\begin{aligned} & 100 \\ & 20 \\ & 17 \\ & 25 \end{aligned}$ | $\begin{aligned} & \hline 11 \\ & 1 \\ & 3 \\ & 7 \end{aligned}$ |  |  | $\begin{aligned} & \hline 125 \\ & 25 \\ & 21 \\ & 31 \end{aligned}$ |  | $\begin{aligned} & \hline 150 \\ & 30 \\ & 26 \\ & 38 \end{aligned}$ | ns | $\begin{aligned} & \hline 2.0 \\ & 4.5 \\ & 6.0 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig. } 19 \text { ) } \end{aligned}$ |

## 8-channel analog multiplexer/demultiplexer with latch

## 74HC/HCT4351

DC CHARACTERISTICS FOR 74HCT
Voltages are referenced to GND (ground =0)

| SYMBOL | PARAMETER | Tamb ${ }^{\circ}{ }^{\text {C }}$ ) |  |  |  |  |  |  | UNIT | TEST CONDITIONS |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 74HCT |  |  |  |  |  |  |  | $V_{c c}$ <br> (V) | $V_{E E}$ <br> (V) | $V_{1}$ | OTHER |
|  |  | +25 |  |  | -40 to +85 |  | -40 to +125 |  |  |  |  |  |  |
|  |  | min. | typ. | max. | min. | max. | min. | max. |  |  |  |  |  |
| $\mathrm{V}_{\mathrm{IH}}$ | HIGH level input voltage | 2.0 | 1.6 |  | 2.0 |  | 2.0 |  | V | $\begin{array}{\|l\|l\|} \hline 4.5 \\ \text { to } \\ 5.5 \\ \hline \end{array}$ |  |  |  |
| VIL | LOW level input voltage |  | 1.2 | 0.8 |  | 0.8 |  | 0.8 | V | $\begin{array}{\|l} \hline 4.5 \\ \text { to } \\ 5.5 \end{array}$ |  |  |  |
| $\pm 1$ | input leakage current |  |  | 0.1 |  | 1.0 |  | 1.0 | $\mu \mathrm{A}$ | 5.5 | 0 | $\mathrm{V}_{\mathrm{CC}}$ or GND |  |
| $\pm \mathrm{l}_{\text {S }}$ | analog switch OFF-state current per channel |  |  | 0.1 |  | 1.0 |  | 1.0 | $\mu \mathrm{A}$ | 10.0 | 0 | $\mathrm{V}_{\mathrm{IH}}$ <br> or VIL | $\begin{aligned} & \hline \mathrm{V}_{\mathrm{S}}{ }^{1}= \\ & \mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}} \\ & \text { (see } \\ & \text { Fig.10) } \\ & \hline \end{aligned}$ |
| $\pm \mathrm{l}_{\text {S }}$ | analog switch OFF-state current all channels |  |  | 0.4 |  | 4.0 |  | 4.0 | $\mu \mathrm{A}$ | 10.0 | 0 | $\mathrm{V}_{\mathrm{IH}}$ <br> or $V_{I L}$ | $\begin{aligned} & \hline \mathrm{V}_{\mathrm{S}} \mid= \\ & \mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}} \\ & \text { (see } \\ & \text { Fig.10) } \\ & \hline \end{aligned}$ |
| $\pm \mathrm{l}_{\text {S }}$ | analog switch ON-state current |  |  | 0.4 |  | 4.0 |  | 4.0 | $\mu \mathrm{A}$ | 10.0 | 0 | $\mathrm{V}_{\mathrm{IH}}$ <br> or $\mathrm{V}_{\mathrm{IL}}$ | $\begin{aligned} & \hline \mathrm{V}_{\mathrm{S}}{ }^{1}= \\ & \mathrm{V}_{\mathrm{CC}}-\mathrm{V}_{\mathrm{EE}} \\ & \text { (see } \\ & \text { Fig.11) } \end{aligned}$ |
| ICC | quiescent supply current |  |  | $\begin{array}{\|l\|} \hline 8.0 \\ 16.0 \end{array}$ |  | $\begin{array}{\|l\|} \hline 80.0 \\ 160.0 \end{array}$ |  | $\begin{aligned} & 160.0 \\ & 320.0 \end{aligned}$ | $\mu \mathrm{A}$ | $\begin{aligned} & 5.5 \\ & 5.0 \end{aligned}$ | $\begin{aligned} & 0 \\ & -5.0 \end{aligned}$ | $\mathrm{V}_{\mathrm{CC}}$ or GND | $\begin{aligned} & \mathrm{V}_{\text {is }}=\mathrm{V}_{\mathrm{EE}} \\ & \text { or } \mathrm{V}_{\mathrm{CC}} ; \\ & \mathrm{V}_{\mathrm{OS}}=\mathrm{V}_{\mathrm{CC}} \\ & \text { or } \mathrm{V}_{\mathrm{EE}} \end{aligned}$ |
| $\Delta \mathrm{l}_{\mathrm{CC}}$ | additional quiescent supply current per input pin for unit load coefficient is 1 (note 1) |  | 100 | 360 |  | 450 |  | 490 | $\mu \mathrm{A}$ | $\begin{array}{\|l} \hline 4.5 \\ \text { to } \\ 5.5 \end{array}$ | 0 | $\begin{aligned} & V_{C C} \\ & -2.1 \mathrm{~V} \end{aligned}$ | other inputs at $\mathrm{V}_{\mathrm{CC}}$ or GND |

## Note to HCT types

1. The value of additional quiescent supply current $\left(\Delta I_{C C}\right)$ for a unit load of 1 is given here. To determine $\Delta \mathrm{I}_{\mathrm{Cc}}$ per input, multiply this value by the unit load coefficient shown in the table below.

| INPUT | UNIT LOAD COEFFICIENT |
| :--- | :--- |
| $\bar{E}_{1}, \mathrm{E}_{2}$ | 0.50 |
| $\frac{S_{n}}{\mathrm{LE}}$ | 0.50 |

## 8-channel analog multiplexer/demultiplexer with latch

AC CHARACTERISTICS FOR 74HCT
$\mathrm{GND}=0 \mathrm{~V} ; \mathrm{t}_{\mathrm{r}}=\mathrm{t}_{\mathrm{f}}=6 \mathrm{~ns} ; \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$

| SYMBOL | PARAMETER | $\mathrm{T}_{\text {amb }}\left({ }^{\circ} \mathrm{C}\right)$ |  |  |  |  |  |  | UNIT | TEST CONDITIONS |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 74HCT |  |  |  |  |  |  |  | $\begin{array}{\|l} \mathrm{v}_{\mathrm{cc}} \\ (\mathrm{~V}) \end{array}$ | $\begin{aligned} & V_{\mathrm{EEE}} \\ & \text { (V) } \end{aligned}$ | OTHER |
|  |  | +25 |  |  | -40 to +85 |  | -40 to +125 |  |  |  |  |  |
|  |  | min. | typ. | max. | min. | max. | min. | max. |  |  |  |  |
| $\mathrm{t}_{\text {PHL }} / \mathrm{t}_{\text {PLH }}$ | $\begin{aligned} & \text { propagation delay } \\ & \mathrm{V}_{\text {is }} \text { to } \mathrm{V}_{\text {os }} \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 6 \\ 4 \end{array}$ | $\begin{aligned} & 12 \\ & \hline 8 \end{aligned}$ |  | $\begin{aligned} & 15 \\ & 10 \end{aligned}$ |  | $\begin{aligned} & 18 \\ & 12 \end{aligned}$ | ns | $\begin{aligned} & 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=\infty ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.17) } \end{aligned}$ |
| tpzH $^{\text {t }}$ PzL | turn "ON" time $\bar{E}_{1}$ to $V_{\text {os }}$ |  | $\begin{array}{\|l\|} \hline 40 \\ 31 \end{array}$ | $\begin{aligned} & \hline 75 \\ & 60 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 94 \\ 75 \end{array}$ |  | $\begin{aligned} & 113 \\ & 90 \end{aligned}$ | ns | $\begin{aligned} & 4.5 \\ & 4.5 \end{aligned}$ | $\begin{aligned} & \hline 0 \\ & -4.5 \end{aligned}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PzH }} / \mathrm{t}_{\text {PzL }}$ | $\begin{aligned} & \text { turn "ON" time } \\ & \mathrm{E}_{2} \text { to } \mathrm{V}_{\mathrm{os}} \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 35 \\ 26 \end{array}$ | $\begin{aligned} & 70 \\ & 50 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 88 \\ 63 \end{array}$ |  | $\begin{aligned} & \hline 105 \\ & 75 \end{aligned}$ | ns | $\begin{aligned} & \hline 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & R_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PzH }} / \mathrm{t}_{\text {PzL }}$ | $\begin{array}{\|l} \hline \text { turn "ON" time } \\ \hline \mathrm{LE} \text { to } \mathrm{V}_{\text {os }} \end{array}$ |  | $\begin{aligned} & 42 \\ & 37 \end{aligned}$ | $\begin{aligned} & 75 \\ & 60 \end{aligned}$ |  | $\begin{aligned} & 94 \\ & 75 \end{aligned}$ |  | $\begin{aligned} & \hline 113 \\ & 90 \end{aligned}$ | ns | $\begin{aligned} & \hline 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & R_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PzH }} / \mathrm{t}_{\text {PzL }}$ | $\begin{aligned} & \text { turn "ON" time } \\ & \mathrm{S}_{\mathrm{n}} \text { to } \mathrm{V}_{\mathrm{os}} \end{aligned}$ |  | $\begin{aligned} & 39 \\ & 30 \end{aligned}$ | $\begin{aligned} & 75 \\ & 60 \end{aligned}$ |  | $\begin{aligned} & 94 \\ & 75 \end{aligned}$ |  | $\begin{array}{\|l} \hline 113 \\ 90 \end{array}$ | ns | $\begin{aligned} & \hline 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & R_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| tPHZ ${ }^{\text {tpLZ }}$ | turn "OFF" time $\bar{E}_{1}$ to $V_{\text {os }}$ |  | $\begin{aligned} & \hline 27 \\ & 20 \end{aligned}$ | $\begin{aligned} & 55 \\ & 40 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 69 \\ 50 \end{array}$ |  | $\begin{aligned} & \hline 83 \\ & 60 \end{aligned}$ | ns | $\begin{aligned} & 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PHZ }} / \mathrm{t}_{\text {PLZ }}$ | $\begin{aligned} & \text { turn "OFF" time } \\ & \mathrm{E}_{2} \text { to } \mathrm{V}_{\mathrm{os}} \end{aligned}$ |  | $\begin{aligned} & 32 \\ & 26 \end{aligned}$ | $\begin{aligned} & 60 \\ & 50 \end{aligned}$ |  | $\begin{aligned} & 75 \\ & 63 \end{aligned}$ |  | $\begin{aligned} & 90 \\ & 75 \end{aligned}$ | ns | $\begin{aligned} & 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \\ & \hline \end{aligned}$ |
| $\mathrm{t}_{\text {PHZ }} / \mathrm{t}_{\text {PLZ }}$ | turn "OFF" time $\overline{\mathrm{LE}}$ to $\mathrm{V}_{\text {os }}$ |  | $\begin{aligned} & \hline 33 \\ & 30 \end{aligned}$ | $\begin{aligned} & 60 \\ & 55 \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 75 \\ 69 \end{array}$ |  | $\begin{aligned} & 90 \\ & 83 \end{aligned}$ | ns | $\begin{aligned} & \hline 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \end{aligned}$ |
| $\mathrm{t}_{\text {PHZ }} / \mathrm{t}_{\text {PLZ }}$ | turn "OFF" time $S_{n}$ to $V_{\text {os }}$ |  | $\begin{array}{\|l\|l\|} \hline 33 \\ 29 \end{array}$ | $\begin{array}{\|l\|} \hline 65 \\ 55 \end{array}$ |  | $\begin{array}{\|l\|} \hline 81 \\ 69 \end{array}$ |  | $\begin{array}{\|l\|} \hline 98 \\ 83 \end{array}$ | ns | $\begin{aligned} & 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.18) } \\ & \hline \end{aligned}$ |
| $\mathrm{t}_{\text {su }}$ | set-up time $S_{n}$ to $\overline{L E}$ | $\begin{aligned} & \hline 12 \\ & 14 \end{aligned}$ | $\begin{aligned} & 6 \\ & \hline 7 \end{aligned}$ |  |  | $\begin{aligned} & \hline 15 \\ & 18 \end{aligned}$ |  | $\begin{aligned} & \hline 18 \\ & 21 \end{aligned}$ | ns | $\begin{aligned} & 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.19) } \end{aligned}$ |
| th | hold time $S_{n}$ to $\overline{L E}$ | $\begin{array}{\|l\|} \hline 5 \\ 5 \end{array}$ | $\begin{array}{\|l\|} \hline-1 \\ -2 \end{array}$ |  |  | $\begin{array}{\|l\|} \hline 5 \\ 5 \end{array}$ |  | $\begin{aligned} & 5 \\ & 5 \end{aligned}$ | ns | $\begin{aligned} & \hline 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=1 \mathrm{k} \Omega ; \\ & \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig.19) } \\ & \hline \end{aligned}$ |
| tw | $\overline{\overline{L E}}$ minimum pulse width HIGH | $\begin{aligned} & 25 \\ & 25 \end{aligned}$ | $\begin{aligned} & \hline 13 \\ & 13 \end{aligned}$ |  |  | $\begin{array}{\|l\|} \hline 31 \\ 31 \end{array}$ |  | $\begin{aligned} & 38 \\ & 38 \end{aligned}$ | ns | $\begin{aligned} & \hline 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \\ \hline \end{array}$ | $\begin{aligned} & R_{L}=1 \mathrm{k} \Omega ; \\ & C_{L}=50 \mathrm{pF} \\ & \text { (see Fig.19) } \end{aligned}$ |

## 8-channel analog multiplexer/demultiplexer with latch



Fig. 8 Test circuit for measuring R R ${ }_{\text {ON }}$.


Fig. 9 Typical Ron as a function of input voltage $V_{\text {is }}$ for $V_{\text {is }}=0$ to $V_{C C}-V_{E E}$.


Fig. 10 Test circuit for measuring OFF-state current.


Fig. 11 Test circuit for measuring ON-state current.

## 8-channel analog multiplexer/demultiplexer with latch

## 74HC/HCT4351

ADDITIONAL AC CHARACTERISTICS FOR 74HC/HCT
Recommended conditions and typical values
$\mathrm{GND}=0 \mathrm{~V} ; \mathrm{T}_{\mathrm{amb}}=25^{\circ} \mathrm{C}$

| SYMBOL | PARAMETER | typ. | UNIT | $V_{c c}$ <br> (V) | $\mathrm{V}_{\mathrm{EE}}$ <br> (V) | $V_{i s(p-p)}$ <br> (V) | CONDITIONS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | sine-wave distortion $f=1 \mathrm{kHz}$ | $\begin{array}{\|l\|} \hline 0.04 \\ 0.02 \end{array}$ | $\begin{array}{\|l\|} \hline \% \\ \% \end{array}$ | $\begin{aligned} & \hline 2.25 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} -2.25 \\ -4.5 \end{array}$ | $\begin{aligned} & \hline 4.0 \\ & 8.0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=10 \mathrm{k} \Omega ; \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig. 14) } \end{aligned}$ |
|  | sine-wave distortion $\mathrm{f}=10 \mathrm{kHz}$ | $\begin{array}{\|l\|} \hline 0.12 \\ 0.06 \end{array}$ | $\begin{array}{\|l\|} \hline \% \\ \% \\ \hline \end{array}$ | $\begin{aligned} & 2.25 \\ & 4.5 \end{aligned}$ | $\begin{aligned} & \hline-2.25 \\ & -4.5 \end{aligned}$ | $\begin{aligned} & \hline 4.0 \\ & 8.0 \end{aligned}$ | $\begin{aligned} & \mathrm{R}_{\mathrm{L}}=10 \mathrm{k} \Omega ; \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} \\ & \text { (see Fig. 14) } \end{aligned}$ |
|  | switch "OFF" signal feed-through | $\begin{aligned} & \hline-50 \\ & -50 \end{aligned}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | $\begin{aligned} & 2.25 \\ & 4.5 \end{aligned}$ | $\begin{aligned} & \hline-2.25 \\ & -4.5 \end{aligned}$ | note 1 | $\mathrm{R}_{\mathrm{L}}=600 \Omega ; \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF}$ <br> (see Figs 12 and 15) |
| $\mathrm{V}_{(\mathrm{p}-\mathrm{p})}$ | crosstalk voltage between control and any switch (peak-to-peak value) | $\begin{aligned} & 120 \\ & 220 \end{aligned}$ | $\begin{aligned} & \mathrm{mV} \\ & \mathrm{mV} \end{aligned}$ | $\begin{aligned} & 4.5 \\ & 4.5 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ -4.5 \end{array}$ |  | $\mathrm{R}_{\mathrm{L}}=600 \Omega ; \mathrm{C}_{\mathrm{L}}=50 \mathrm{pF} ;$ $\mathrm{f}=1 \mathrm{MHz}\left(\overline{\mathrm{E}}_{1}, \mathrm{E}_{2} \text { or } \mathrm{S}_{\mathrm{n}},\right.$ <br> square-wave between $V_{C C}$ <br> and GND, $\mathrm{t}_{\mathrm{r}}=\mathrm{t}_{\mathrm{f}}=6 \mathrm{~ns}$ ) <br> (see Fig.16) |
| $\mathrm{f}_{\text {max }}$ | minimum frequency response (-3dB) | $\begin{aligned} & \hline 160 \\ & 170 \end{aligned}$ | MHz <br> MHz | $\begin{aligned} & \hline 2.25 \\ & 4.5 \end{aligned}$ | $\begin{aligned} & -2.25 \\ & -4.5 \end{aligned}$ | note 2 | $\mathrm{R}_{\mathrm{L}}=50 \Omega ; \mathrm{C}_{\mathrm{L}}=10 \mathrm{pF}$ (see Figs 13 and 14) |
| $\mathrm{C}_{S}$ | maximum switch capacitance independent (Y) common <br> (Z) | $\begin{aligned} & 5 \\ & 25 \end{aligned}$ | $\begin{aligned} & \mathrm{pF} \\ & \mathrm{pF} \end{aligned}$ |  |  |  |  |

## Notes to AC characteristics

1. Adjust input voltage $\mathrm{V}_{\text {is }}$ to 0 dBm level $(0 \mathrm{dBm}=1 \mathrm{~mW}$ into $600 \Omega)$.
2. Adjust input voltage $\mathrm{V}_{\text {is }}$ to 0 dBm level at $\mathrm{V}_{\text {os }}$ for $1 \mathrm{MHz}(0 \mathrm{dBm}=1 \mathrm{~mW}$ into $50 \Omega)$.
$V_{\text {is }}$ is the input voltage at a $Y_{n}$ or $Z$ terminal, whichever is assigned as an input.
$V_{\text {os }}$ is the output voltage at a $Y_{n}$ or $Z$ terminal, whichever is assigned as an output.


Test conditions:
$\mathrm{V}_{\mathrm{CC}}=4.5 \mathrm{~V} ; \mathrm{GND}=0 \mathrm{~V} ; \mathrm{V}_{\mathrm{EE}}=-4.5 \mathrm{~V}$;
$R_{L}=50 \Omega ; R_{\text {source }}=1 \mathrm{k} \Omega$.


Fig. 13 Typical frequency response.


Fig. 14 Test circuit for measuring sine-wave distortion and minimum frequency response.


Fig. 15 Test circuit for measuring switch "OFF" signal feed-through.


The crosstalk is defined as follows (oscilloscope output):


Fig. 16 Test circuit for measuring crosstalk between control and any switch.

## 8-channel analog multiplexer/demultiplexer with latch

## 74HC/HCT4351

## AC WAVEFORMS



Fig. 17 Waveforms showing the input $\left(\mathrm{V}_{\text {is }}\right)$ to output $\left(\mathrm{V}_{\mathrm{os}}\right)$ propagation delays.


HC : $\mathrm{V}_{\mathrm{M}}=50 \%$; $\mathrm{V}_{\mathrm{I}}=\mathrm{GND}$ to $\mathrm{V}_{\mathrm{Cc}}$.
HCT: $\mathrm{V}_{\mathrm{M}}=1.3 \mathrm{~V} ; \mathrm{V}_{\mathrm{I}}=\mathrm{GND}$ to 3 V .

Fig. 18 Waveforms showing the turn-ON and turn-OFF times.
$H C: V_{M}=50 \% ; V_{1}=G N D$ to $V_{C c}$.
HCT: $\mathrm{V}_{\mathrm{M}}=1.3 \mathrm{~V} ; \mathrm{V}_{\mathrm{I}}=\mathrm{GND}$ to 3 V .

Fig. 19 Waveforms showing the set-up and hold times from $S_{n}$ inputs to $\overline{L E}$ input, and minimum pulse width of $\overline{\mathrm{LE}}$.

## TEST CIRCUIT AND WAVEFORMS

## Conditions

| TEST | SWITCH | $\mathbf{V}_{\text {is }}$ |
| :--- | :--- | :--- |
| $\mathrm{t}_{\text {PZH }}$ | $\mathrm{V}_{\mathrm{EE}}$ | $\mathrm{V}_{\mathrm{CC}}$ |
| $\mathrm{t}_{\mathrm{PZL}}$ | $\mathrm{V}_{\mathrm{CC}}$ | $\mathrm{V}_{\mathrm{EE}}$ |
| $\mathrm{t}_{\mathrm{PHZ}}$ | $\mathrm{V}_{\mathrm{EE}}$ | $\mathrm{V}_{\mathrm{CC}}$ |
| $\mathrm{t}_{\text {PLZ }}$ | $\mathrm{V}_{\mathrm{CC}}$ | $\mathrm{V}_{\mathrm{EE}}$ |
| others | open | pulse |



| FAMILY | AMPLITUDE | $\mathbf{V}_{\mathbf{M}}$ | $\mathbf{t}_{\mathbf{r}} ; \mathbf{t}_{\mathbf{f}}$ |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  | OTHER |  |
| 74 HC | $\mathrm{V}_{\mathrm{CC}}$ | $50 \%$ | $<2 \mathrm{~ns}$ | 6 ns |
| 74 HCT | 3.0 V | 1.3 V | $<2 \mathrm{~ns}$ | 6 ns |

$C_{L} \quad=\quad$ load capacitance including jig and probe capacitance (see AC CHARACTERISTICS for values).
$\mathrm{R}_{\mathrm{T}} \quad=$ termination resistance should be equal to the output impedance $\mathrm{Z}_{\mathrm{O}}$ of the pulse generator.
$t_{r}=t_{f}=6 \mathrm{~ns}$; when measuring $f_{\max }$, there is no constraint on $t_{r}, t_{f}$ with $50 \%$ duty factor.

Fig. 20 Test circuit for measuring AC performance.

Conditions

| TEST | SWITCH | $\mathbf{V}_{\text {is }}$ |
| :--- | :--- | :--- |
| $\mathrm{t}_{\mathrm{PZH}}$ | $\mathrm{V}_{\mathrm{EE}}$ | $\mathrm{V}_{\mathrm{CC}}$ |
| $\mathrm{t}_{\mathrm{PZL}}$ | $\mathrm{V}_{\mathrm{CC}}$ | $\mathrm{V}_{\mathrm{EE}}$ |
| $\mathrm{t}_{\mathrm{PHZ}}$ | $\mathrm{V}_{\mathrm{EE}}$ | $\mathrm{V}_{\mathrm{CC}}$ |
| $\mathrm{t}_{\mathrm{PLZ}}$ | $\mathrm{V}_{\mathrm{CC}}$ | $\mathrm{V}_{\mathrm{EE}}$ |
| others | open | pulse |



| FAMILY | AMPLITUDE | $\mathbf{V}_{\mathbf{M}}$ | $\mathbf{t}_{\mathbf{r}} ; \mathbf{t}_{\mathbf{f}}$ |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  | $\mathbf{f}_{\text {max }} ;$ <br> PULSE WIDTH | OTHER |
|  | $\mathrm{V}_{\mathrm{CC}}$ | $50 \%$ | $<2 \mathrm{~ns}$ | 6 ns |
| 74 HCT | 3.0 V | 1.3 V | $<2 \mathrm{~ns}$ | 6 ns |

$C_{L} \quad=\quad$ load capacitance including jig and probe capacitance (see AC CHARACTERISTICS for values).
$R_{T} \quad=$ termination resistance should be equal to the output impedance $Z_{O}$ of the pulse generator.
$t_{r}=t_{f}=6 n s$; when measuring $f_{\text {max }}$, there is no constraint on $t_{r}, t_{f}$ with $50 \%$ duty factor.

Fig. 21 Input pulse definitions.

## 8-channel analog multiplexer/demultiplexer with latch

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## PACKAGE OUTLINES

See "74HC/HCT/HCU/HCMOS Logic Package Outlines".

