

**QUADRUPLE 2-INPUT MULTIPLEXERS WITH STORAGE**

**DESCRIPTION**

The M74LS298P is a semiconductor integrated circuit which containing four 2-line to 1-line multiplexers provided with a temporary storage circuit with common selection input and clock input.

**FEATURES**

- One line data can be selected from 2-line data.
- Equipped with D-type negative edge-triggered flip-flop.
- Wide operating temperature range ( $T_a = -20 \sim +75^\circ\text{C}$ )

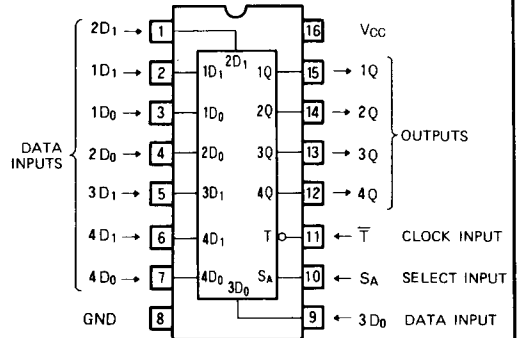
**APPLICATION**

General purpose, for use in industrial and consumer equipment.

**FUNCTIONAL DESCRIPTION**

When the select input  $S_A$  is low, data input  $D_0$  is selected, and when it is high, data input  $D_1$  is selected. When the clock input  $\bar{T}$  changes from high to low, the selected data appears in the output  $Q$ . Since a D-type negative edge-triggered flip-flop is used as a temporary storage circuit, the status of  $Q$  does not change even if  $D$  is changed, whether  $\bar{T}$  is high or low.

**PIN CONFIGURATION (TOP VIEW)**



Outline 16P4

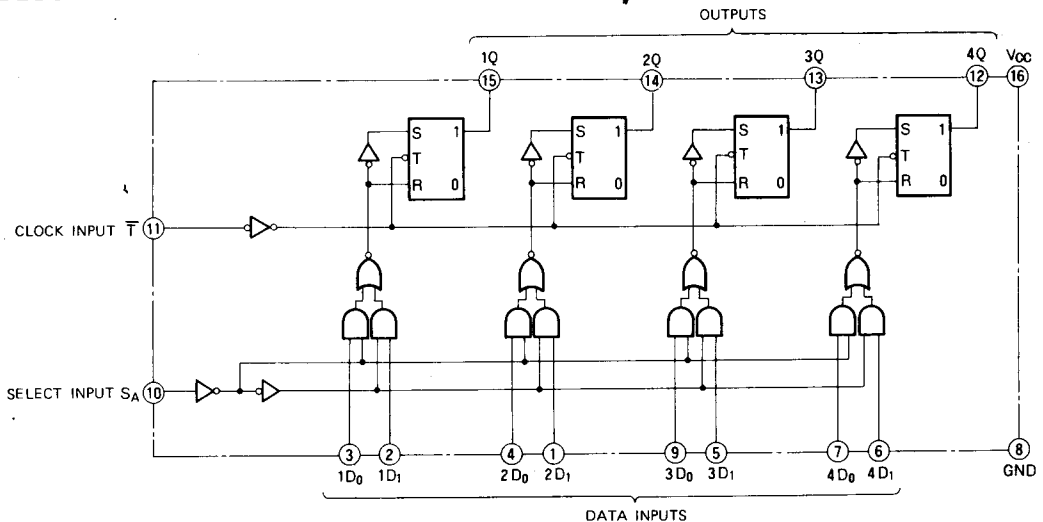
**FUNCTION TABLE (Note 1)**

$\bar{T}$	$S_A$	$D_0$	$D_1$	$Q$
↓	L	L	X	L
↓	L	H	X	H
↓	H	X	L	L
↓	H	X	H	H

Note 1: ↓ : transition from high to low-level

X : irrelevant

**BLOCK DIAGRAM**



**QUADRUPLE 2-INPUT MULTIPLEXERS WITH STORAGE**

**ABSOLUTE MAXIMUM RATINGS** ( $T_a = -20 \sim +75^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Limits	Unit
$V_{CC}$	Supply voltage		-0.5 ~ +7	V
$V_i$	Input voltage		-0.5 ~ +15	V
$V_o$	Output voltage	High-level state	-0.5 ~ $V_{CC}$	V
$T_{opr}$	Operating free-air ambient temperature range		-20 ~ +75	$^\circ\text{C}$
$T_{stg}$	Storage temperature range		-65 ~ +150	$^\circ\text{C}$

**RECOMMENDED OPERATING CONDITIONS** ( $T_a = -20 \sim +75^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
$V_{CC}$	Supply voltage	4.75	5	5.25	V
$I_{OH}$	High-level output current	$V_{OH} \geq 2.7\text{V}$	0	-400	$\mu\text{A}$
$I_{OL}$	Low-level output current	$V_{OL} \leq 0.4\text{V}$	0	4	$\text{mA}$
		$V_{OL} \leq 0.5\text{V}$	0	8	$\text{mA}$

**ELECTRICAL CHARACTERISTICS** ( $T_a = -20 \sim +75^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
$V_{IH}$	High-level input voltage		2			V
$V_{IL}$	Low-level input voltage				0.8	V
$V_{IC}$	Input clamp voltage	$V_{CC} = 4.75\text{V}$ , $I_{IC} = -18\text{mA}$			-1.5	V
$V_{OH}$	High-level output voltage	$V_{CC} = 4.75\text{V}$ , $V_i = 0.8\text{V}$ $V_i = 2\text{V}$ , $I_{OH} = -400\mu\text{A}$	2.7	3.4		V
$V_{OL}$	Low-level output voltage	$V_{CC} = 4.75\text{V}$		0.25	0.4	V
		$V_i = 0.8\text{V}$ , $V_i = 2\text{V}$		0.35	0.5	V
$I_{IH}$	High-level input current	$V_{CC} = 5.25\text{V}$ , $V_i = 2.7\text{V}$			20	$\mu\text{A}$
		$V_{CC} = 5.25\text{V}$ , $V_i = 10\text{V}$			0.1	$\text{mA}$
$I_{IL}$	Low-level input current	$V_{CC} = 5.25\text{V}$ , $V_i = 0.4\text{V}$			-0.4	$\text{mA}$
$I_{OS}$	Short-circuit output current (Note 2)	$V_{CC} = 5.25\text{V}$ , $V_o = 0\text{V}$	-20		-100	$\text{mA}$
$I_{CC}$	Supply current	$V_{CC} = 5.25\text{V}$ (Note 3)		13	21	$\text{mA}$

\* : All typical values are at  $V_{CC} = 5\text{V}$ ,  $T_a = 25^\circ\text{C}$ .

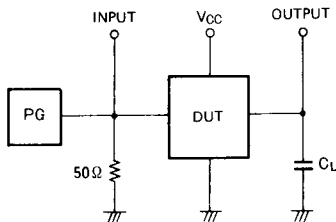
Note 2: All measurements should be done quickly, and not more than one output should be shorted at a time.

3:  $I_{CC}$  is measured with  $S_A$ ,  $1D_0 \sim 4D_1$  inputs grounded and a momentary 4.5V, then grounded, applied  $\bar{T}$  input.

**SWITCHING CHARACTERISTICS** ( $V_{CC} = 5\text{V}$ ,  $T_a = 25^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$t_{PLH}$	Low-to-high-level, high-to-low-level output propagation time, from input $\bar{T}$ to outputs $1Q \sim 4Q$	$C_L = 15\text{pF}$ (Note 4)		12	27	ns
$t_{PHL}$				11	32	ns

Note 4: Measurement circuit



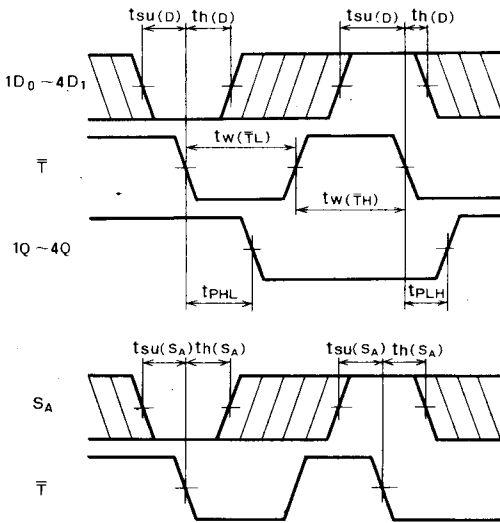
- (1) The pulse generator (PG) has the following characteristics:  
 $PRR = 1\text{MHz}$ ,  $t_r = 6\text{ns}$ ,  $t_f = 6\text{ns}$ ,  $t_w = 500\text{ns}$ ,  
 $V_p = 3\text{V}_{p.p.}$ ,  $Z_o = 50\Omega$
- (2)  $C_L$  includes probe and jig capacitance.

**QUADRUPLE 2-INPUT MULTIPLEXERS WITH STORAGE**

**TIMING REQUIREMENTS** ( $V_{CC}=5V$ ,  $T_a=25^{\circ}C$ , unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$t_{W(\overline{T}H)}$	Clock input $\overline{T}$ high pulse width		20	7		ns
$t_{W(\overline{T}L)}$	Clock input $\overline{T}$ low pulse width		20	4		ns
$t_f$	Clock pulse fall time		15	0		ns
$t_{SU(D)}$	Setup time data input to $\overline{T}$		15	0		ns
$t_{SU(S_A)}$	Setup time $S_A$ to $\overline{T}$		25	5		ns
$t_{H(D)}$	Hold time data input to $\overline{T}$		5	0		ns
$t_{H(S_A)}$	Hold time $S_A$ to $\overline{T}$		0	-2		ns

**TIMING DIAGRAM (Reference level = 1.3V)**

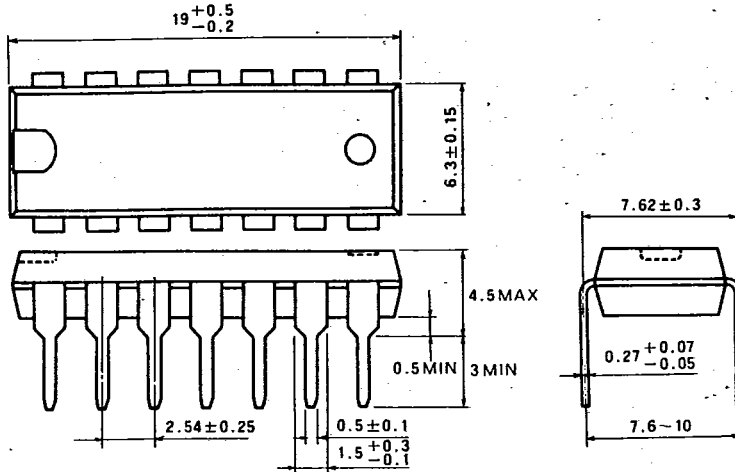


Note 5: The shaded areas indicate when the input is permitted to change for predictable output performance.

T-90-20

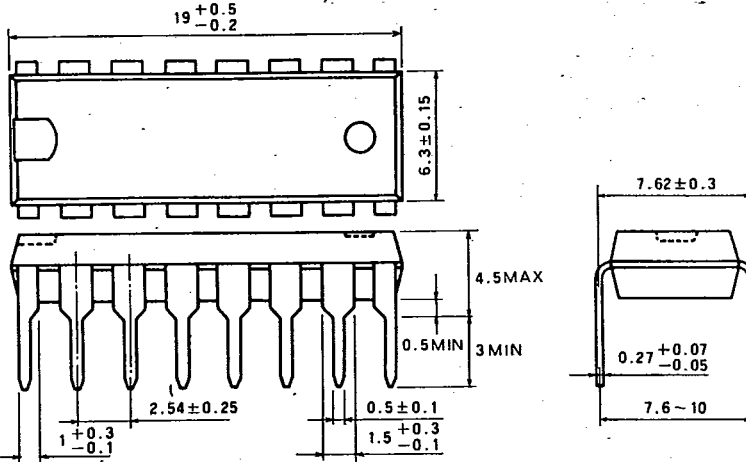
**TYPE 14P4 14-PIN MOLDED PLASTIC DIL**

Dimension in mm



**TYPE 16P4 16-PIN MOLDED PLASTIC DIL**

Dimension in mm



**TYPE 20P4 20-PIN MOLDED PLASTIC DIL**

Dimension in mm

