

PRELIMINARY

Notice: This is not a final specification
Some parametric limits are subject to change.

M74AS257P

QUADRUPLE 2-LINE TO 1-LINE DATA SELECTOR/MULTIPLEXER WITH 3-STATE OUTPUT

T-66-21-51

DESCRIPTION

The M74AS257P is a semiconductor integrated circuit consisting of four 2-line to 1-line data selector/multiplexer circuits with 3-state outputs.

FEATURES

- Output control input common to all 4 circuits
- Select input common to all 4 circuits
- High fan-out, 3-state output ($I_{OL}=48mA$, $I_{OH}=-15mA$)
- Wide operating temperature range ($T_a=-20\sim+75^{\circ}C$)

APPLICATION

General purpose, for use in industrial and consumer digital equipment.

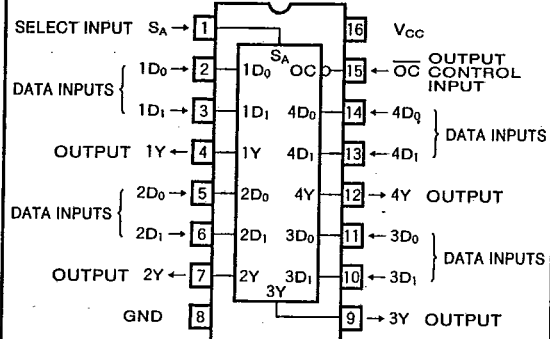
FUNCTIONAL DESCRIPTION

This IC has four data selector circuits which provide 1-line selection of 2 input signals. They can also be used as four multiplexer circuits which convert 2-bit parallel data into serial data by time-sharing. When 2-line signals are applied to the data inputs D_0 and D_1 , 1 data input is specified at select input S_A , the specified signal is output at Y.

S_A and output control \overline{OC} are common to all four circuits. When \overline{OC} is set high, 1Y, 2Y, 3Y and 4Y are put in the high-impedance state irrespective of the status of the other inputs.

M74AS257P has the same functions and pin connections as M74AS157P but the latter is provided with active pull-up outputs.

PIN CONFIGURATION (TOP VIEW)



Outline 16P4

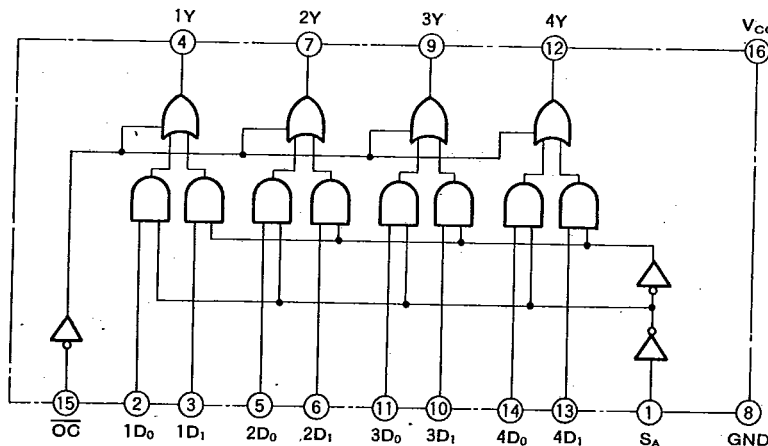
FUNCTION TABLE (Note 1)

OC	Inputs			Output Y
	S_A	D_0	D_1	
H	X	X	X	Z
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

Note 1. X: Irrelevant

Z: High-impedance state

LOGIC DIAGRAM



6249827 MITSUBISHI (DGTL LOGIC)

91D 12214 D

**QUADRUPLE 2-LINE TO 1-LINE DATA SELECTOR/MULTIPLEXER
WITH 3-STATE OUTPUT**

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

Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		-0.5~+7	V
V_i	Input voltage		-0.5~+7	V
V_o	Output voltage	High-level state or high-impedance state	-0.5~+5.5	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

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V_{CC}	Supply voltage	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			V
V_{IL}	Low-level input voltage			0.8	V
I_{OH}	High-level output current	0		-15	mA
I_{OL}	Low-level output current	0		48	mA
T_{opr}	Operating free-air ambient temperature range	-20		+75	$^\circ\text{C}$

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

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
V_{IC}	Input clamp voltage	$V_{CC}=4.5\text{V}, I_{IC}=-18\text{mA}$			-1.2	V
V_{OH}	High-level output voltage	$V_{CC}=4.5\text{V} \sim 5.5\text{V}, I_{OH}=-2\text{mA}$	$V_{CC}-2$			V
		$V_{CC}=4.5\text{V}, I_{OH}=-15\text{mA}$	2.4	3.2		
V_{OL}	Low-level output voltage	$V_{CC}=4.5\text{V}, I_{OL}=48\text{mA}$			0.5	V
I_{OZH}	Off-state high-level output current	$V_{CC}=5.5\text{V}, V_o=2.7\text{V}$			50	μA
I_{OZL}	Off-state low-level output current	$V_{CC}=5.5\text{V}, V_o=0.4\text{V}$			-50	μA
I_i	Input current at maximum voltage	S_A			0.2	mA
		D_0, D_1, OC	$V_{CC}=5.5\text{V}, V_i=7\text{V}$		0.1	
I_{IH}	High-level input current	S_A			40	μA
		D_0, D_1, OC	$V_{CC}=5.5\text{V}, V_i=2.7\text{V}$		20	
I_{iL}	Low-level input current	S_A			-1	mA
		D_0, D_1, OC	$V_{CC}=5.5\text{V}, V_i=0.4\text{V}$		-0.5	
I_o	Output current	$V_{CC}=5.5\text{V}, V_o=2.25\text{V}$	-30		-112	mA
I_{CCH}	Supply current, all outputs high	$V_{CC}=5.5\text{V}$		12.1	19.7	mA
I_{CCL}	Supply current, all outputs low	$V_{CC}=5.5\text{V}$		19	30.6	mA
I_{CCZ}	Supply current, all outputs disabled	$V_{CC}=5.5\text{V}$		19.7	31.9	mA

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

QUADRUPLE 2-LINE TO 1-LINE DATA SELECTOR/MULTIPLEXER WITH 3-STATE OUTPUT

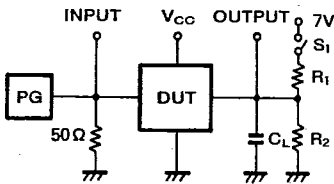
T-66-21-51

SWITCHING CHARACTERISTICS

Symbol	Parameter	Test conditions/Limits								Unit
		V _{CC} =4.5~5.5V (Note 2)								
		C _L =50pF								
		R ₁ =500Ω								
		T _a =0~70°C				T _a =-20~+75°C				
		Inputs	Output	Min	Typ*	Max	Min	Typ*	Max	
t _{PLH}	Propagation time	D ₀ , D ₁	Y	1		5.5	1		6	
t _{PHL}				1		6	1		6.5	
t _{PLH}		S _A	Y	2		11	2		12	
t _{PHL}				2		10	2		11	
t _{PZH}	Output enable time	\overline{OC}	Y	2		7.5	2		8	
t _{PZL}				2		9.5	2		10.5	
t _{PHZ}	Output disable time	\overline{OC}	Y	1.5		6.5	1.5		7	
t _{PLZ}				2		7	2		7.5	

*: All typical values are at V_{CC}=5V, T_a=25°C.

Note 2: Measurement circuit



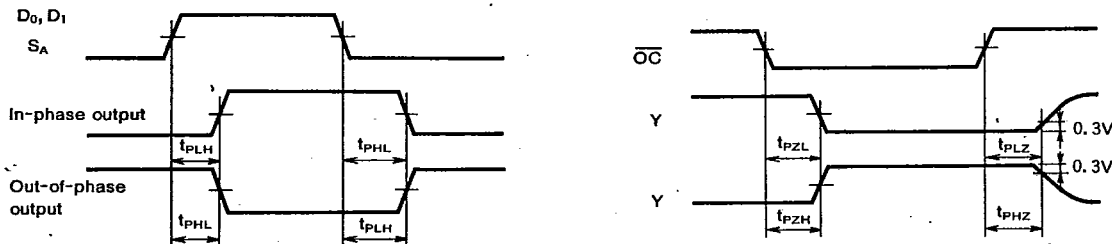
(1) The pulse generator (PG) has the following characteristics:

- PRR ≤ 1MHz
- t_r = 2ns, t_f = 2ns
- V_{IH} = 3.5V, V_{IL} = 0.3V
- duty cycle = 50%
- Z_o = 50Ω

(2) C_L includes probe and jig capacitance.

Parameter	S ₁
t _{PLH}	Open
t _{PHL}	Open
t _{PZH}	Open
t _{PZL}	Closed
t _{PHZ}	Open
t _{PLZ}	Closed

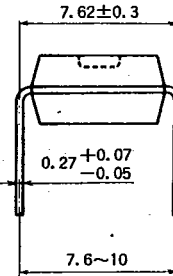
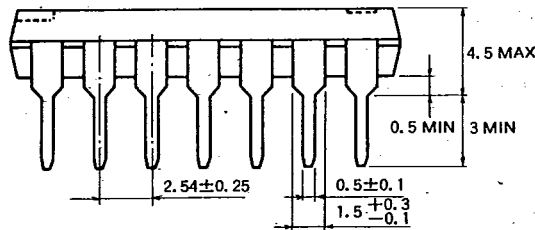
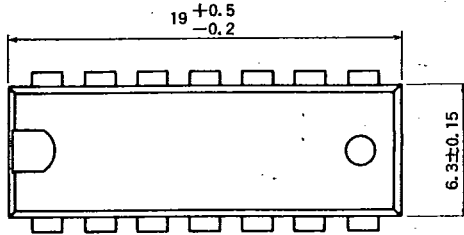
TIMING DIAGRAM (Reference level = 1.3V)



T-90-20

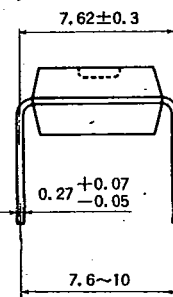
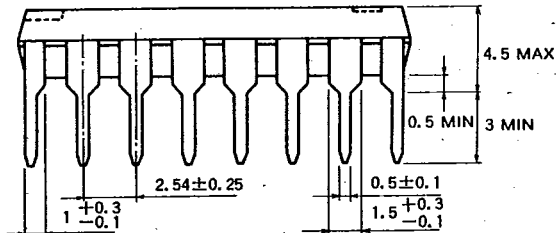
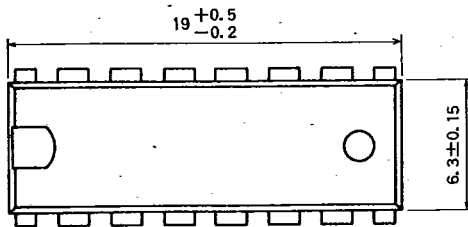
TYPE 14P4 14-PIN MOLDED PLASTIC DIP

Dimension in mm



TYPE 16P4 16-PIN MOLDED PLASTIC DIP

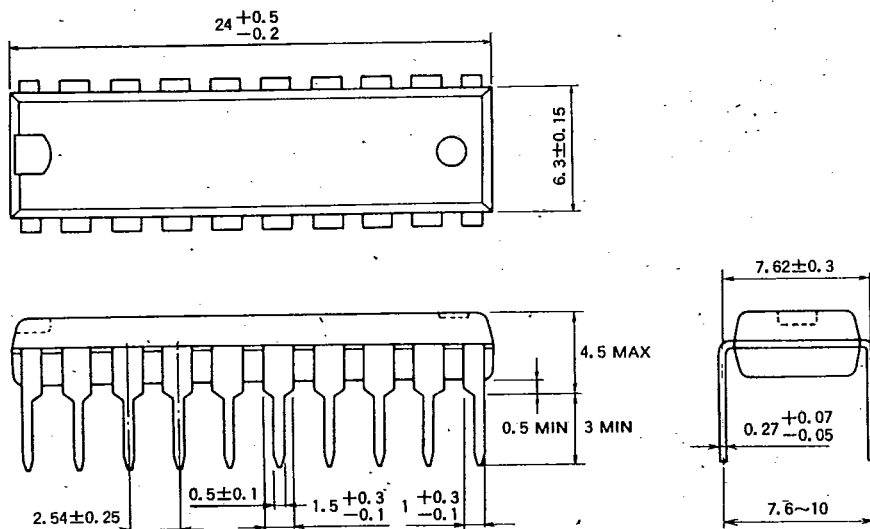
Dimension in mm



T-90-20

TYPE 20P4 20-PIN MOLDED PLASTIC DIP

Dimension in mm



TYPE 24P4D 24-PIN MOLDED PLASTIC DIP

Dimension in mm

