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

MITSUBISHI ASTTLs

M74AS240P

T-52-07

OCTAL BUFFER/LINE DRIVER WITH 3-STATE OUTPUT (INVERTED)

DESCRIPTION

The M74AS240P is a semiconductor integrated circuit consisting of two blocks of buffers with 3-state inverted outputs and independent output control for each block.

FEATURES

- In-phase output control inputs ($1\overline{OC}$, $2\overline{OC}$)
- High fan-out, 3-state output (I_{OL}=64mA, I_{OH}=−15mA)
- Wide operating temperature range (T_a=−20~+75℃)

APPLICATION

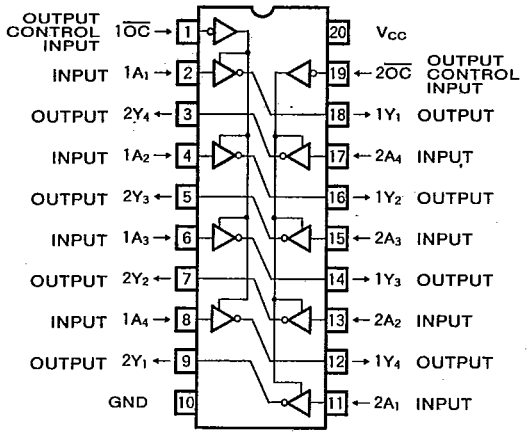
General purpose, for use in industrial and consumer digital equipment.

FUNCTIONAL DESCRIPTION

When output control input $\overline{OC}$ is low-level, and if input A is low, then output Y is high, if A is high, Y is low. When $\overline{OC}$ is high, $Y_1 \sim Y_4$ are in high-impedance state irrespective of the status of A.

The outputs of all eight buffers can be simultaneously controlled by connecting $1\overline{OC}$ and $2\overline{OC}$.

PIN CONFIGURATION (TOP VIEW)



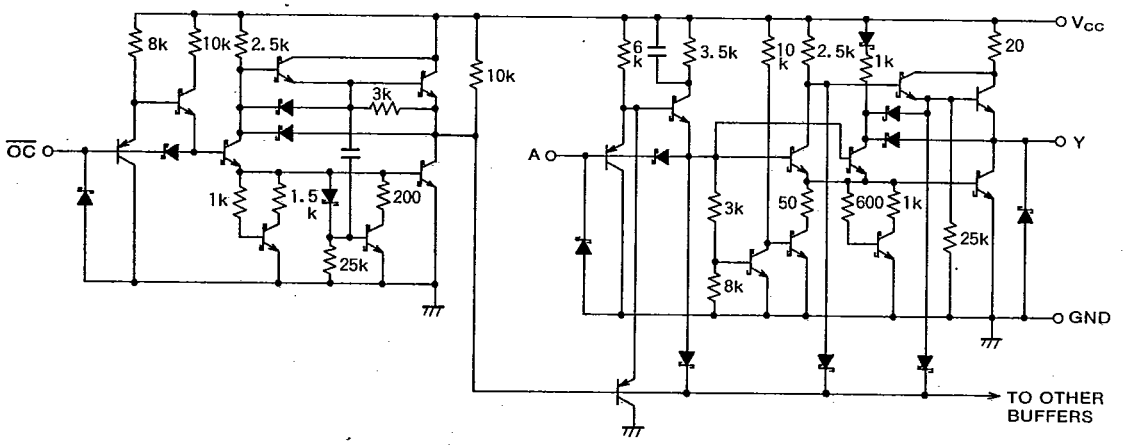
Outline 20P4

FUNCTION TABLE (Note 1)

Inputs		Output
A	$\overline{OC}$	Y
L	L	H
H	L	L
X	H	Z

Note 1: Z : High-impedance state
X : Irrelevant

CIRCUIT SCHEMATIC (EACH BUFFER)



UNIT : Ω

MITSUBISHI ELECTRIC

OCTAL BUFFER/LINE DRIVER WITH 3-STATE OUTPUT (INVERTED)

ABSOLUTE MAXIMUM RATINGS (T_a=−20∼+75℃, 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	℃
T_{stg}	Storage temperature range		−65∼+150	℃

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		64	mA
T_{opr}	Operating free-air ambient temperature range	−20		+75	℃

ELECTRICAL CHARACTERISTICS (T_a=−20∼+75℃, unless otherwise noted)

Symbol	Parameter	Test conditions		Limits			Unit
				Min	Typ*	Max	
V_{IC}	Input clamp voltage	V_{CC}=4.5V, I_{IC}=−18mA				−1.2	V
V_{OH}	High-level output voltage	V_{CC}=4.5V∼5.5V, I_{OH}=−2mA		V_{CC}−2			V
		V_{CC}=4.5V	I_{OH}=−3mA	2.4	3.4		
			I_{OH}=−15mA	2.4			
V_{OL}	Low-level output voltage	V_{CC}=4.5V, I_{OL}=64mA				0.55	V
I_{OZH}	Off-state high-level output current	V_{CC}=5.5V, V_O=2.7V				50	μA
I_{OZL}	Off-state low-level output current	V_{CC}=5.5V, V_O=0.4V				−50	μA
I_I	Input current at maximum voltage	V_{CC}=5.5V, V_I=7V				0.1	mA
I_{IH}	High-level input current	V_{CC}=5.5V, V_I=2.7V				20	μA
I_{IL}	Low-level input current	V_{CC}=5.5V, V_I=0.4V				−0.5	mA
I_O	Output current	V_{CC}=5.5V, V_O=2.25V		−50		−150	mA
I_{CCH}	Supply current, all outputs high	V_{CC}=5.5V			11	17	mA
I_{CCL}	Supply current, all outputs low	V_{CC}=5.5V			51	75	mA
I_{CCZ}	Supply current, all outputs disabled	V_{CC}=5.5V			24	38	mA

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

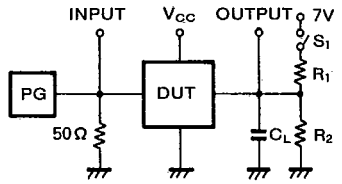
OCTAL BUFFER/LINE DRIVER WITH 3-STATE OUTPUT (INVERTED)

SWITCHING CHARACTERISTICS

Symbol	Parameter	Input	Output	Test conditions/Limits: V_{CC}=4.5~5.5V, C_L=50pF, R_1=500Ω, R_2=500Ω (Note 2)						Unit
				T_a=0~70℃			T_a=−20~+75℃			
				Min	Typ*	Max	Min	Typ*	Max	
t_{PLH}	Propagation time	A	Y	2		6.5	2		7	ns
t_{PHL}				2		5.7	2		6	
t_{PZH}	Output enable time	$\overline{OC}$	Y	2		6.4	2		7	ns
t_{PZL}				2		9	2		9.5	
t_{PHZ}	Output disable time	$\overline{OC}$	Y	2		5	2		5.5	ns
t_{PLZ}				2		9.5	2		10.5	

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

Note 2: Measurement circuit

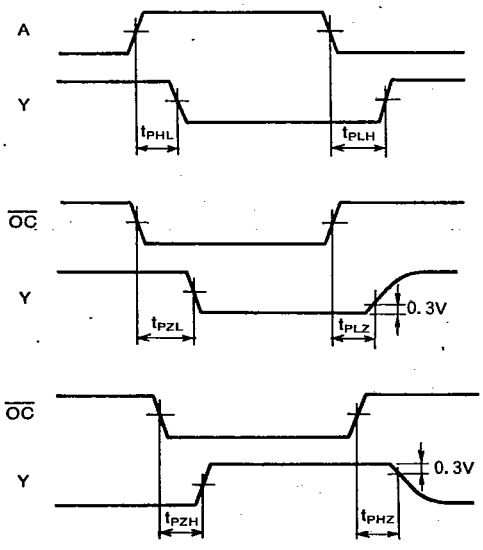


(1) The pulse generator (PG) has the following characteristics:
PRR≦1MHz
t_r=2ns, t_f=2ns
V_{IH}=3.5V, V_{IL}=0.3V
duty cycle=50%
Z_O=50Ω

(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)

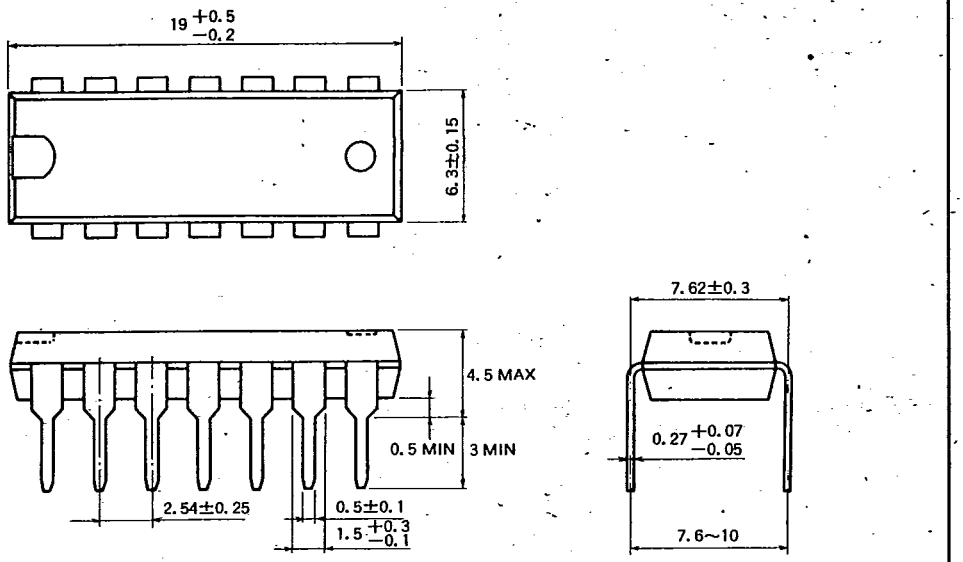


MITSUBISHI ELECTRIC

PACKAGE OUTLINES

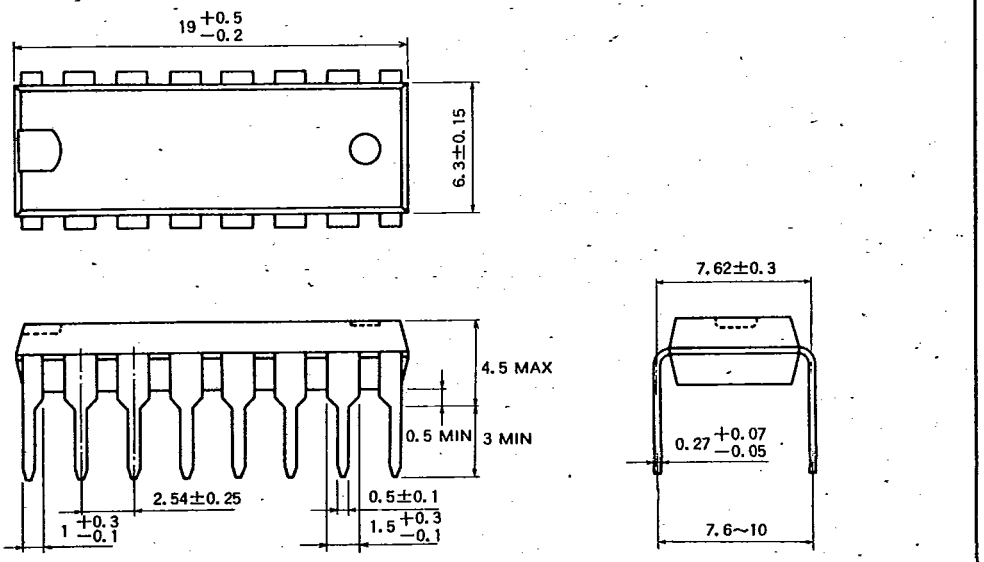
TYPE 14P4 14-PIN MOLDED PLASTIC DIP

Dimension in mm



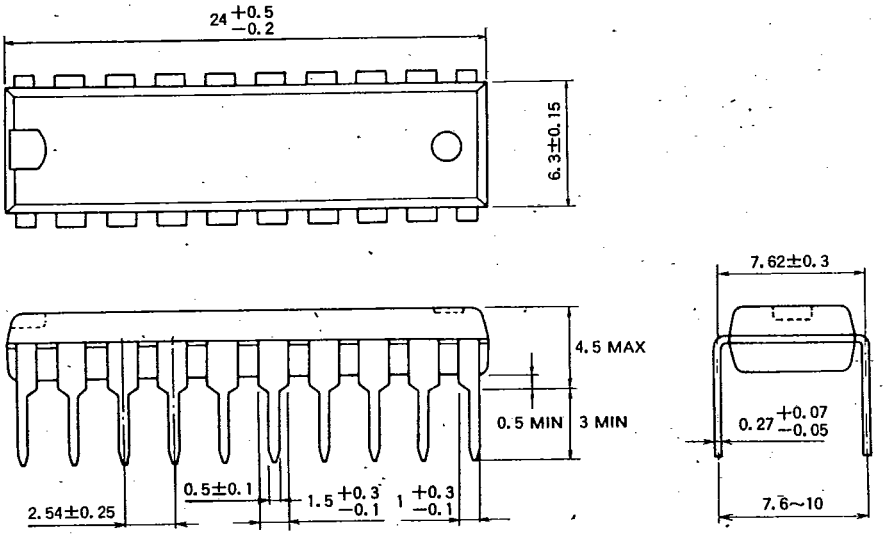
TYPE 16P4 16-PIN MOLDED PLASTIC DIP

Dimension in mm



TYPE 20P4 20-PIN MOLDED PLASTIC DIP

Dimension in mm



TYPE 24P4D 24-PIN MOLDED PLASTIC DIP

Dimension in mm