

MITSUBISHI LSTTLs
M74LS05P

HEX INVERTERS WITH OPEN COLLECTOR OUTPUTS

DESCRIPTION

The M74LS05P is a semiconductor integrated circuit containing 6 open collector output inverter circuits.

FEATURES

- Usable in AND-Tie connection.
- High breakdown input voltage ($V_I \geq 15V$)
- Low power dissipation ($P_D = 12mW$ typical)
- High speed ($t_{pd} = 10ns$ typical)
- Wide operating temperature range ($T_a = -20 \sim +75^\circ C$)

APPLICATION

General purpose, for use in industrial and consumer equipment.

FUNCTIONAL DESCRIPTION

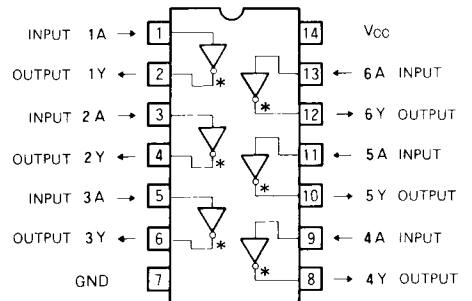
With the use of Schottky barrier diodes for the inputs and open-collector outputs, the high-level output impedance can be selected freely by use of an external load resistor. This permits wire-AND connection, which has been impossible with conventional gates.

When input A is high, output Y is low, and when A is low, Y is high.

FUNCTION TABLE

A	Y
L	H
H	L

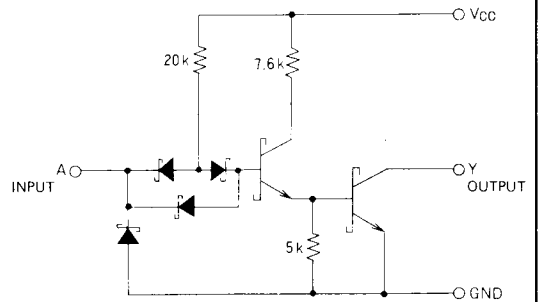
PIN CONFIGURATION (TOP VIEW)



* : OPEN COLLECTOR OUTPUT

Outline 14P4

CIRCUIT SCHEMATIC (EACH INVERTER)



UNIT : Ω

ABSOLUTE MAXIMUM RATINGS ($T_a = -20 \sim +75^\circ C$, 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 ~ + 7	V
T_{opr}	Operating free-air ambient temperature range		- 20 ~ + 75	$^\circ C$
T_{stg}	Storage temperature range		- 65 ~ + 150	$^\circ C$

HEX INVERTERS WITH OPEN COLLECTOR OUTPUTS

RECOMMENDED OPERATING CONDITIONS (Ta = -20 ~ +75°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 _O = 5.5V	0		100	μA
I _{OL}	Low-level output current	V _{OL} ≤ 0.4V	0		4	mA
		V _{OL} ≤ 0.5V	0		8	mA

ELECTRICAL CHARACTERISTICS (Ta = -20 ~ +75°C, unless otherwise noted)

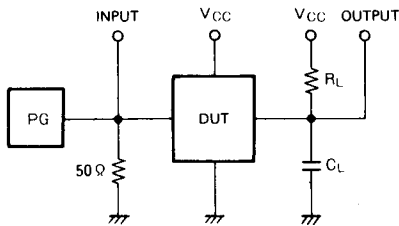
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
V _{IH}	High-level input voltage		2			V
V _{IL}	Low-level input voltage				0.8	V
V _{IC}	Input clamp voltage	V _{CC} = 4.75V, I _{IC} = -18mA			-1.5	V
I _{OH}	High-level output current	V _{CC} = 4.75V, V _I = 0.8V, V _O = 5.5V			100	μA
V _{OL}	Low-level output voltage	V _{CC} = 4.75V V _I = 2V	I _{OL} = 4mA	0.25	0.4	V
				I _{OL} = 8mA	0.35	0.5
I _{IH}	High-level input current	V _{CC} = 5.25V, V _I = 2.7V			20	μA
		V _{CC} = 5.25V, V _I = 10V			0.1	mA
I _{IL}	Low-level input current	V _{CC} = 5.25V, V _I = 0.4V			-0.4	mA
I _{CCH}	Supply current, all outputs high	V _{CC} = 5.25V, V _I = 0V		1.2	2.4	mA
I _{CCL}	Supply current, all outputs low	V _{CC} = 5.25V, V _I = open		3.6	6.6	mA

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

SWITCHING CHARACTERISTICS (V_{CC} = 5V, Ta = 25°C, unless otherwise noted)

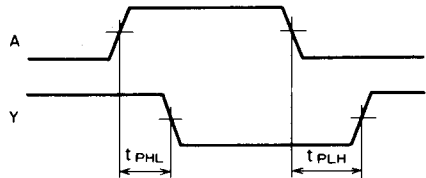
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
t _{PLH}	Low-to-high-level output propagation time	R _L = 2 kΩ		10	32	ns
t _{PHL}	High-to-low-level output propagation time	C _L = 15pF (Note 1)		10	28	ns

Note 1: Measurement circuit



- The pulse generator (PG) has the following characteristics:
PRR = 1MHz, t_r = 6ns, t_f = 6ns, t_w = 500ns,
V_p = 3V_{p-p}, Z₀ = 50Ω
- C_L includes probe and jig capacitance.

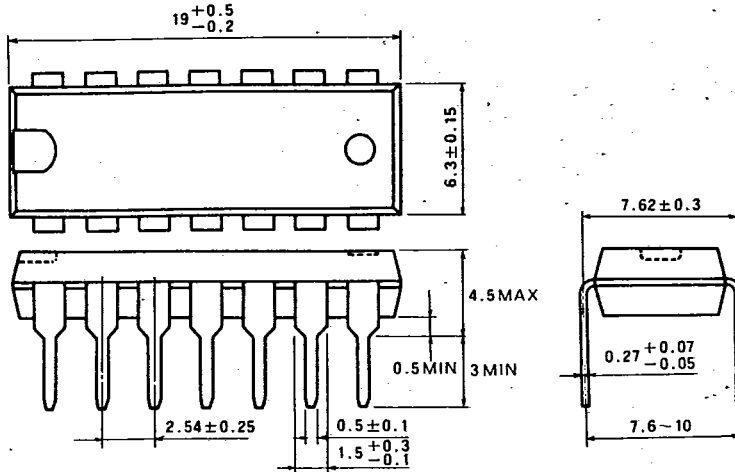
TIMING DIAGRAM (Reference level = 1.3V)



T-90-20

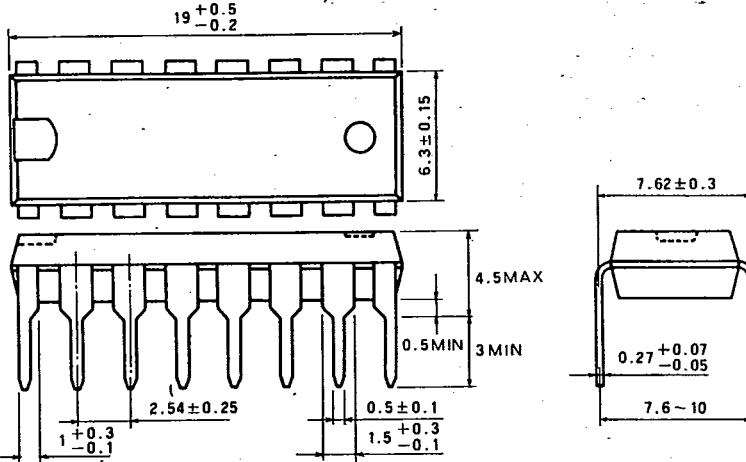
TYPE 14P4 14-PIN MOLDED PLASTIC DIL

Dimension in mm



TYPE 16P4 16-PIN MOLDED PLASTIC DIL

Dimension in mm



TYPE 20P4 20-PIN MOLDED PLASTIC DIL

Dimension in mm

