

# MITSUBISHI LSTTLs M74LS08P

## QUADRUPLE 2-INPUT POSITIVE AND GATES

### DESCRIPTION

The M74LS08P is a semiconductor integrated circuit containing 4 dual input-positive AND and negative OR gates.

### FEATURES

- High breakdown input voltage ( $V_i \geq 15V$ )
- Low power dissipation ( $P_D = 17mW$  typical)
- High speed ( $t_{pd} = 10ns$  typical)
- Low output impedance
- Wide operating temperature range ( $T_a = -20 \sim +75^\circ C$ )

### APPLICATION

General purpose, for use in industrial and consumer equipment.

### FUNCTIONAL DESCRIPTION

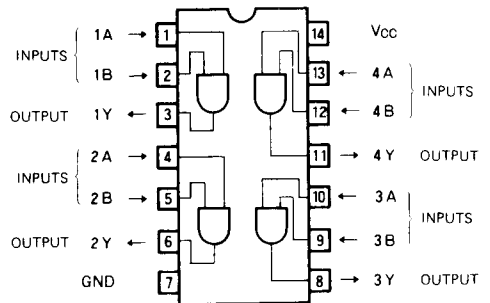
The use of Schottky TTL technology, enables the achievement of high input voltage, high speed, low power dissipation, and high fan-out.

When both inputs A and B are high, output Y is high, and when either or both of the inputs are low, Y is low.

### FUNCTION TABLE

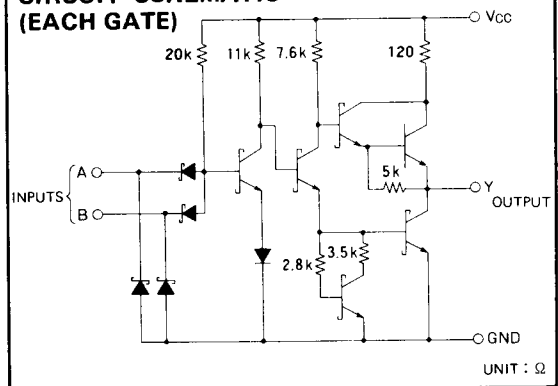
A	B	Y
L	L	L
H	L	L
L	H	L
H	H	H

### PIN CONFIGURATION (TOP VIEW)



Outline 14P4

### CIRCUIT SCHEMATIC (EACH GATE)



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

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

QUADRUPLE 2-INPUT POSITIVE AND GATES

RECOMMENDED OPERATING CONDITIONS (Ta = -20 ~ +75°C, unless otherwise noted)

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V <sub>CC</sub>	Supply voltage		4.75	5	5.25	V
I <sub>OH</sub>	High-level output current	V <sub>OH</sub> ≥ 2.7V	0		-400	μA
I <sub>OL</sub>	Low-level output current	V <sub>OL</sub> ≤ 0.4V	0		4	mA
		V <sub>OL</sub> ≤ 0.5V	0		8	mA

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

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
V <sub>IH</sub>	High-level input voltage		2			V
V <sub>IL</sub>	Low-level input voltage				0.8	V
V <sub>IC</sub>	Input clamp voltage	V <sub>CC</sub> = 4.75V, I <sub>IC</sub> = -18mA			-1.5	V
V <sub>OH</sub>	High-level output voltage	V <sub>CC</sub> = 4.75V, V <sub>I</sub> = 2V, I <sub>OH</sub> = -400 μA	2.7	3.4		V
V <sub>OL</sub>	Low-level output voltage	V <sub>CC</sub> = 4.75V, I <sub>OL</sub> = 4 mA		0.25	0.4	V
		V <sub>I</sub> = 0.8V, I <sub>OL</sub> = 8 mA		0.35	0.5	V
I <sub>IH</sub>	High-level input current	V <sub>CC</sub> = 5.25V, V <sub>I</sub> = 2.7V			20	μA
		V <sub>CC</sub> = 5.25V, V <sub>I</sub> = 10V			0.1	mA
I <sub>IL</sub>	Low-level input current	V <sub>CC</sub> = 5.25V, V <sub>I</sub> = 0.4V			-0.4	mA
I <sub>OS</sub>	Short-circuit output current (Note 1)	V <sub>CC</sub> = 5.25V, V <sub>O</sub> = 0V	-20		-100	mA
I <sub>OCH</sub>	Supply current, all outputs high	V <sub>CC</sub> = 5.25V, V <sub>I</sub> = 4.5V		2.4	4.8	mA
I <sub>OCL</sub>	Supply current, all outputs low	V <sub>CC</sub> = 5.25V, V <sub>I</sub> = 0V		4.4	8.8	mA

\* : All typical values are at V<sub>CC</sub> = 5V, Ta = 25°C.

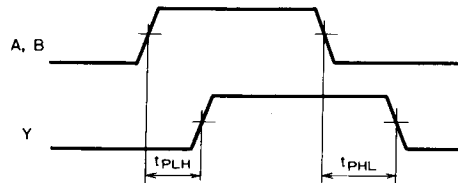
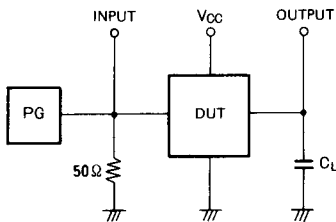
Note 1: All measurement should be done quickly, and not more than one output should be shorted at a time.

SWITCHING CHARACTERISTICS (V<sub>CC</sub> = 5V, Ta = 25°C, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
t <sub>PLH</sub>	Low-to-high-level output propagation time	C <sub>L</sub> = 15 pF		9	15	ns
t <sub>PHL</sub>	High-to-low-level output propagation time	(Note 2)		10	20	ns

Note 2: Measurement circuit

TIMING DIAGRAM (Reference level = 1.3V)



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

PRR = 1MHz, t<sub>r</sub> = 6ns, t<sub>f</sub> = 6ns, t<sub>w</sub> = 500ns,

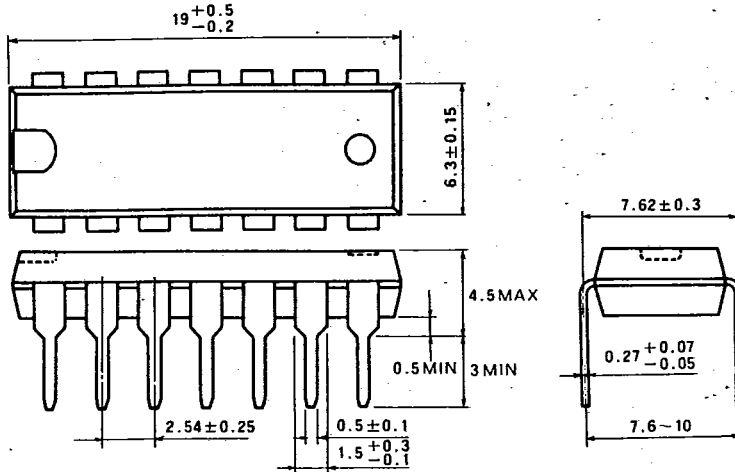
V<sub>p</sub> = 3V<sub>p-p</sub>, Z<sub>0</sub> = 50Ω

(2) C<sub>L</sub> includes probe and jig capacitance.

T-90-20

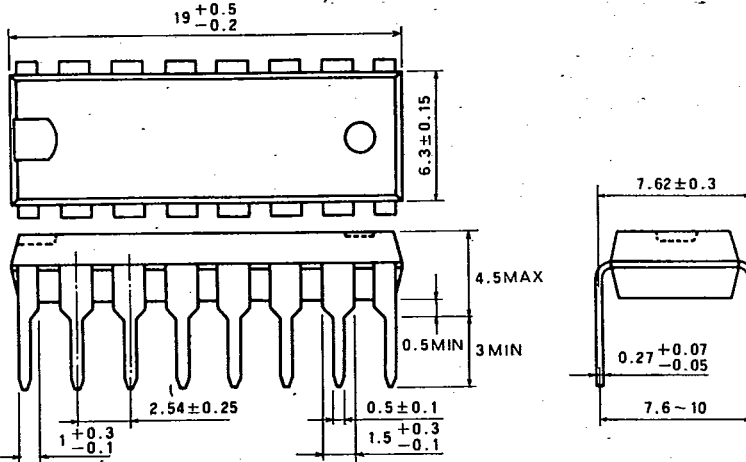
**TYPE 14P4 14-PIN MOLDED PLASTIC DIL**

Dimension in mm



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

Dimension in mm



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

Dimension in mm

