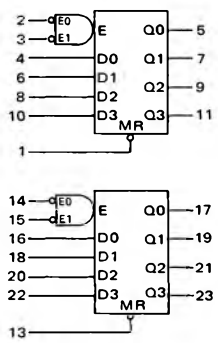
DUAL 4-BIT LATCH

MC8308P*



V_{CC} = Pin 24
GND = Pin 12

Input Loading Factors:
D0, D1, D2, D3 = 1.5
MR, E0, E1 = 1.0
Output Loading Factor = 9

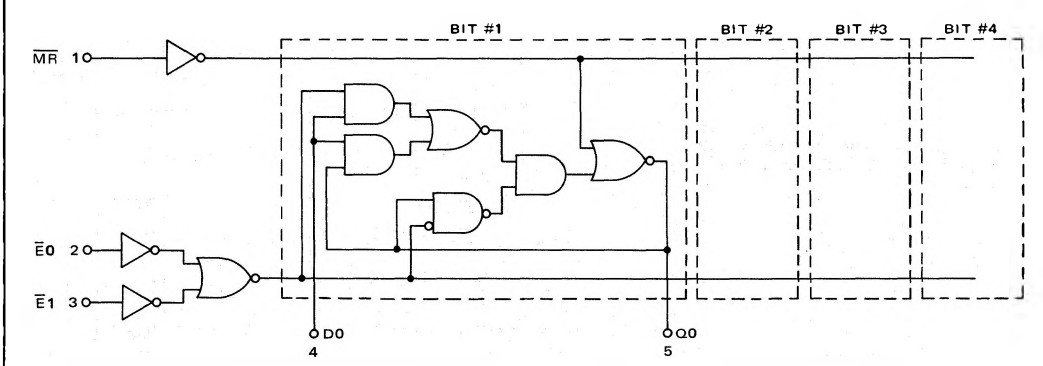
Total Power Dissipation = 325 mW typ/pkg
Propagation Delay Time (Enable to Output) = 25 ns typ

This device is constructed of AND, NAND, and NOR gates. Each half of the device contains four latches with common enable ($\overline{E}0$) and $\overline{E}1$) and common Master Reset ($\overline{MR}$). Data entered at the D input of each latch will appear at the corresponding Q output if the enable inputs are in the logic "0" state. When the enable inputs are in the logic "1" state, each latch will maintain the information present when the enable inputs were last in the logic "0" state. The master reset input overrides all other input states. When a logic "0" is applied to the $\overline{MR}$ input, all outputs of the quad latch will be forced to a logic "0".

INPUTS							OUTPUTS			
$\overline{MR}$	$\overline{E}0$	$\overline{E}1$	D3	D2	D1	D0	Q3	Q2	Q1	Q0
1	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	1	0	0	0	1
1	0	0	0	0	1	0	0	0	1	0
1	0	0	0	1	0	0	0	1	0	0
1	0	0	1	0	0	0	1	0	0	0
1	0	0	0	0	1	1	0	0	1	1
1	0	0	0	1	0	1	0	1	0	1
1	0	0	1	0	0	1	1	0	0	1
1	0	0	0	1	1	0	0	1	1	0
1	0	0	1	0	1	0	1	0	1	0
1	0	0	1	1	0	0	1	1	0	0
1	0	0	0	1	1	1	0	1	1	1
1	0	0	1	0	1	1	1	0	1	1
1	0	0	1	1	0	1	1	1	0	1
1	0	0	1	1	1	0	1	1	1	0
1	0	0	1	1	1	1	1	1	1	1
1	0	1	X	X	X	X	LATCHED			
1	1	0	X	X	X	X	LATCHED			
1	1	1	X	X	X	X	LATCHED			
0	X	X	X	X	X	X	0	0	0	0

X = Don't Care

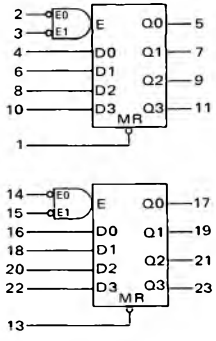
LOGIC DIAGRAM
1/2 OF DEVICE SHOWN



*P suffix = 24-pin dual in-line plastic package (Case 649).

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one bit of one half of the device. The other bits are tested in the same manner.

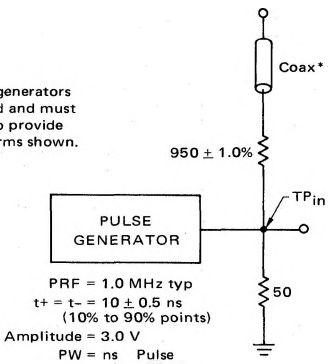


@ Test Temperature	TEST CURRENT/VOLTAGE VALUES mA I_{OL1}	I_{OL2}	I_{OH}	I_D	Volts V_{IL}	V_{IH}	V_F	V_R	V_{CC}	V_{CCL}	V_{CCH}
0°C	12.7	14.4	-0.6	–	0.85	1.9	0.45	4.5	–	4.75	5.25
+25°C	12.7	14.4	-0.6	-10	0.85	1.8	0.45	4.5	5.0	4.75	5.25
+75°C	12.7	14.4	-0.6	–	0.85	1.6	0.45	4.5	–	4.75	5.25

Characteristic	Symbol	Pin Under Test	MC8308 Test Limits 0°C Min	0°C Max	+25°C Min	+25°C Max	+75°C Min	+75°C Max	Unit	TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL1}	I_{OL2}	I_{OH}	I_D	V_{IL}	V_{IH}	V_F	V_R	V_{CC}	V_{CCL}	V_{CCH}	Gnd
Input																					
Forward Current	I_F	1	–	-1.6	–	-1.6	–	-1.6	mAdc	–	–	–	–	–	–	1	–	–	–	24	12
		2	–	-1.6	–	-1.6	–	-1.6	↓	–	–	–	–	–	–	2	–	–	–	↓	12
		4	–	-2.7	–	-2.7	–	-2.7	↓	–	–	–	–	–	–	–	–	–	–	↓	4, 12
Leakage Current	I_R	1	–	–	–	60	–	–	μAdc	–	–	–	–	–	–	–	1	–	–	24	12
		2	–	–	–	60	–	–	↓	–	–	–	–	–	–	–	2	–	–	↓	↓
		4	–	–	–	90	–	–	↓	–	–	–	–	–	–	–	4	–	–	↓	↓
Clamp Voltage	V_D	1	–	–	–	-1.5	–	–	Vdc	–	–	–	1	–	–	–	–	–	–	24	12
		2	–	–	–	↓	–	–	↓	–	–	–	2	–	–	–	–	–	–	↓	↓
		4	–	–	–	↓	–	–	↓	–	–	–	4	–	–	–	–	–	–	↓	↓
Output																					
Output Voltage	V_{OL1}	5	–	0.45	–	0.45	–	0.45	Vdc	5	–	–	–	2,3,4	–	–	–	–	24	–	12
	V_{OL2}	5	–	0.45	–	0.45	–	0.45	Vdc	–	5	–	–	2,3,4	–	–	–	–	–	24	12
	V_{OH}	5	2.4	–	2.4	–	2.4	–	Vdc	–	–	5	–	2,3	4	–	–	–	24	–	12
Power Requirements														V_{IL}							
(Total Device)																					
Power Supply Drain	I_{PHD}	24	–	–	–	117	–	–	mAdc	–	–	–	–	2,3,4,6,8,10,14, 15,16,18,20,22				24	–	–	12
Switching Parameters										Pulse In		Pulse Out									
Data Setup "1" Time	t_{Setup} "1"	5	–	–	2.0	–	–	–	ns	2, 4		5		–				24	–	–	3, 12
Data Hold "1" Time	t_{Hold} "1"	5	–	–	15	–	–	–	ns	2, 4		5		–				24	–	–	3, 12
Turn-Off Delay	t_{pd+}	5	–	–	–	44	–	–	ns	2, 4		5		–				24	–	–	3, 12
Data Setup "0" Time	t_{Setup} "0"	5	–	–	6.0	–	–	–	ns	2, 4		5		–				24	–	–	3, 12
Data Hold "0" Time	t_{Hold} "0"	5	–	–	8.0	–	–	–	ns	2, 4		5		–				24	–	–	3, 12
Turn-On Delay	t_{pd-}	5	–	–	–	30	–	–	ns	2, 4		5		–				24	–	–	3, 12

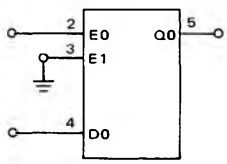
SWITCHING TIME TEST CIRCUIT AND VOLTAGE WAVEFORMS

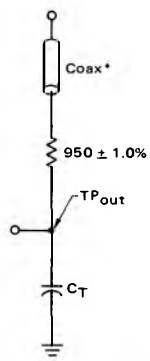
Two pulse generators are required and must be slaved to provide the waveforms shown.



PRF = 1.0 MHz typ
t+ = t− = 10 ± 0.5 ns
(10% to 90% points)
Amplitude = 3.0 V

PW = ns	Pulse
30	X
47	Y
44	Z

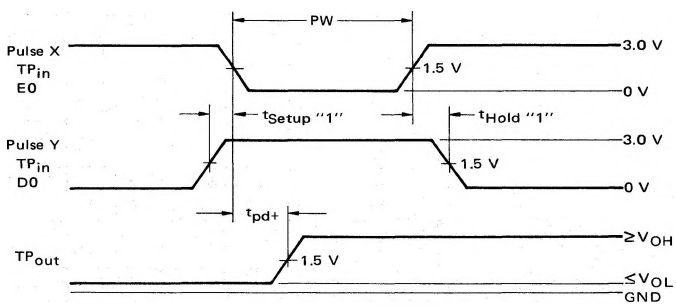




C_T = 15 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

*The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.

STORING A "1"



STORING A "0"