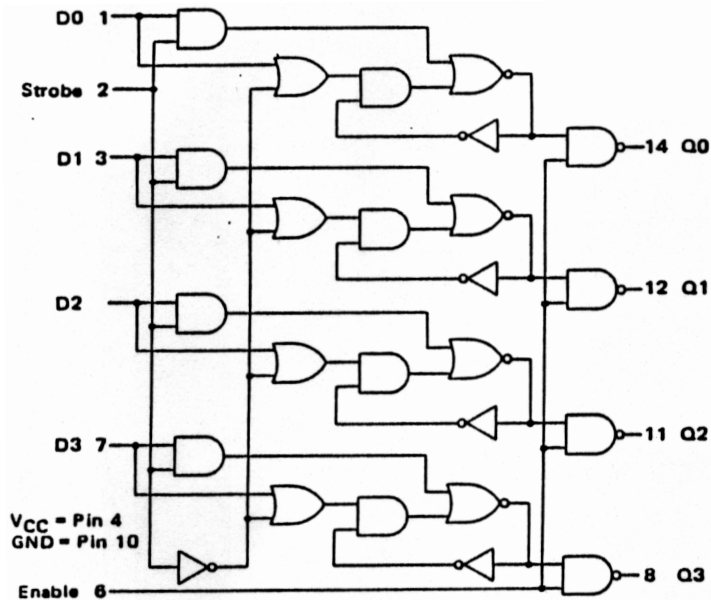


Legacy Device: *Motorola MC4335*



Two 5.0 k ohm pullup resistors are internally connected to V_{CC} and brought out on pins 9 and 13.

This monolithic device consists of four latch circuits with open collector outputs common Strobe input, and output enable input. The output of each latch will follow the data input when the Strobe input is in a logical "1" state. When the Strobe is in a logical "0" state, the latch will store the logic state of the data input just prior to the change of the Strobe from a "1" level to a "0" level.

The open collector outputs make this device useful for bussing or wire ORing outputs together. Two 5.0 k ohm resistor are available in the package to provide the passive pullup function in wired-OR or bussed operation. The output enable is useful where it is desirable to gate information out of the latches according to a predetermined timing scheme.

Input Loading Factor (MTTL 1 Loads):

Data Input (Strobe High) – 4335 = 4.2

Data Input (Strobe Low) – 4335 = 1.1

Output Enable – 4335 = 4.0

Output Loading Factor (TTL 1 Loads):

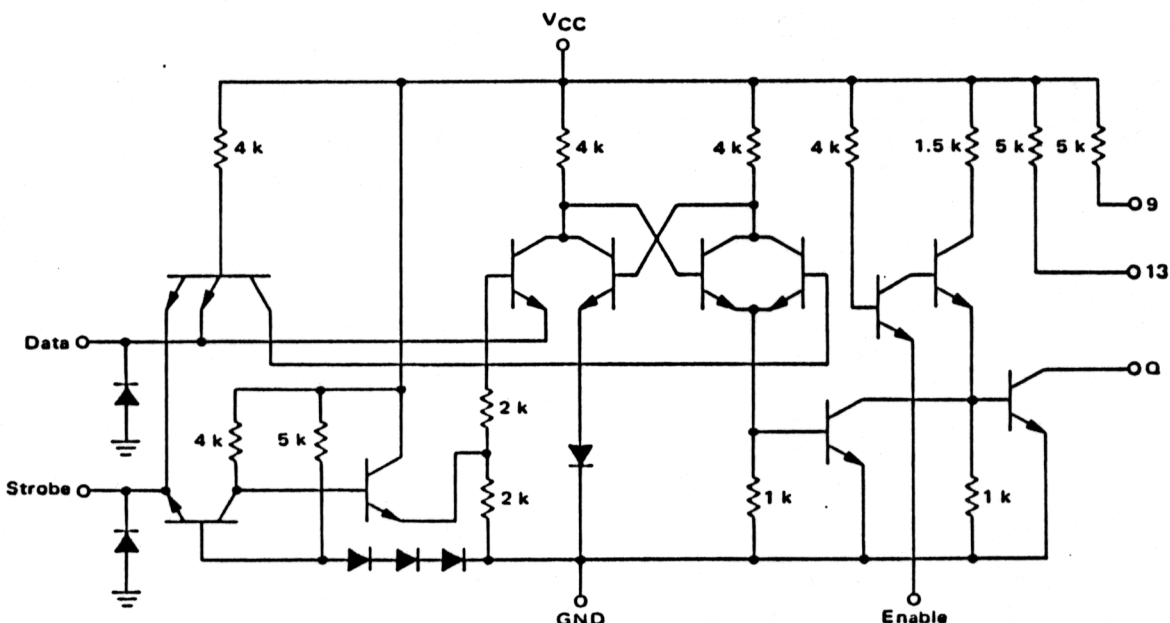
4335 = 7 (IOL = 9.3 mAdc)

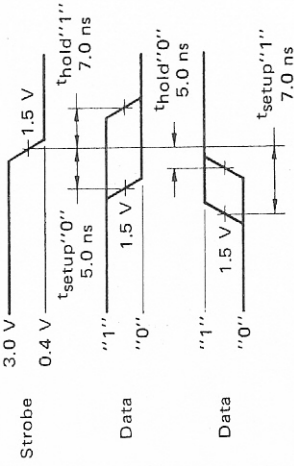
Total Power Dissipation = 140 mW typ/pkg

Propagation Delay Time - 25 ns typ

CIRCUIT SCHEMATIC

1/4 OF DEVICE SHOWN



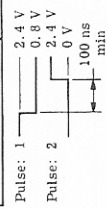


This quad latch consists of four gated latches that store data on the negative edge of the strobe input. Information must be present at the data inputs prior to the setup time and remain at the data inputs through the hold time to insure that it will be stored by the latch when the negative edge of the strobe occurs. The setup time is 7.0 ns for a logical "1" and 5.0 ns for a logical "0". Hold time is 7.0 ns after the strobe edge for a logical "1" and 5.0 ns prior to the strobe edge for a logical "0".

ELECTRICAL CHARACTERISTICS

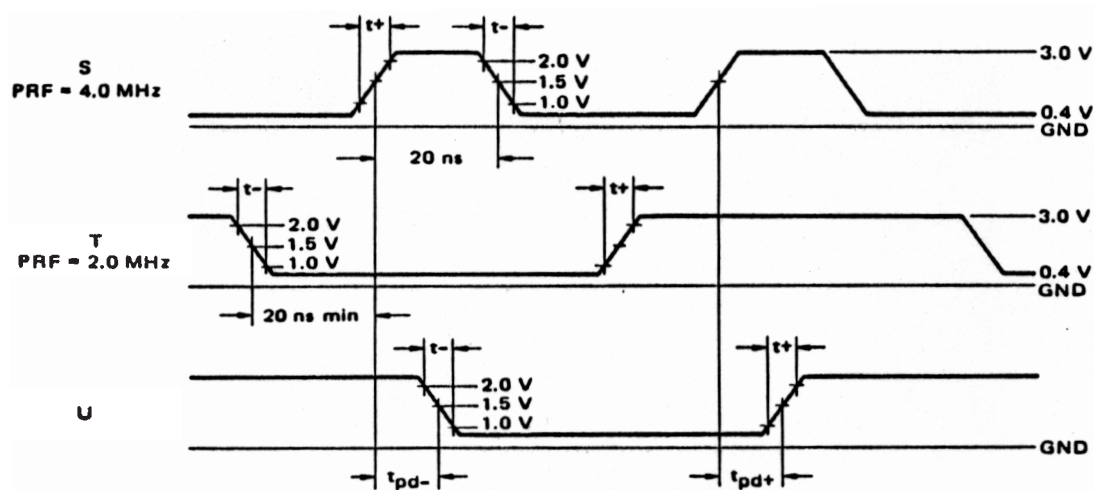
Test procedures are shown for the Strobe, Enable, and only one data input, and for one output. Other data inputs and outputs are tested in the same manner.

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Characteristic	Symbol	Pin Under Test	MC4335 Test Limits						TEST CURRENT/VOLTAGE VALUES (All Temperatures)												Pulse																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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			Min	Max	Min	Max	Min	Max	I _{OL}	I _{OH}	I _{in}	V _{IL}	V _{IH}	V _F	V _R	V _{out}	V _{max}	V _{CC}	V _{ccl}	V _{cch}																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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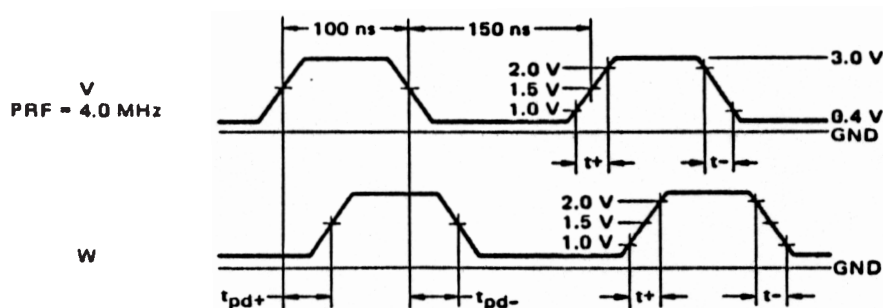


VOLTAGE WAVEFORMS

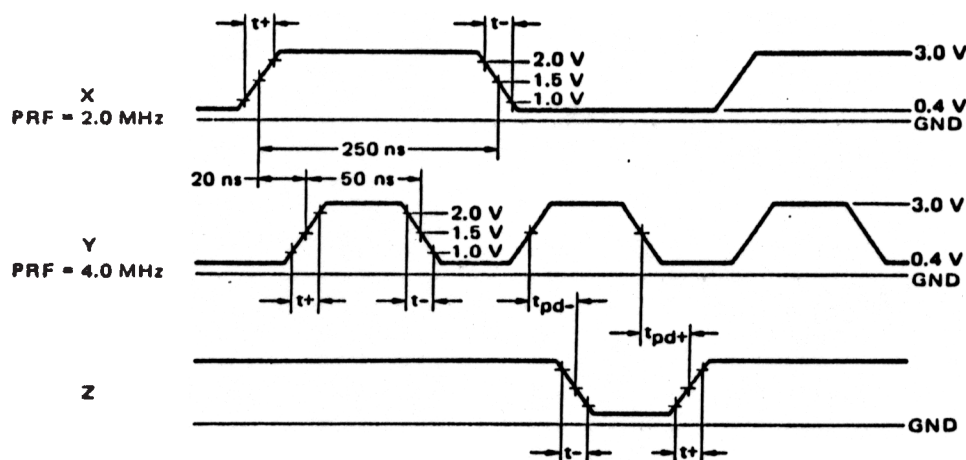
Strobe Input



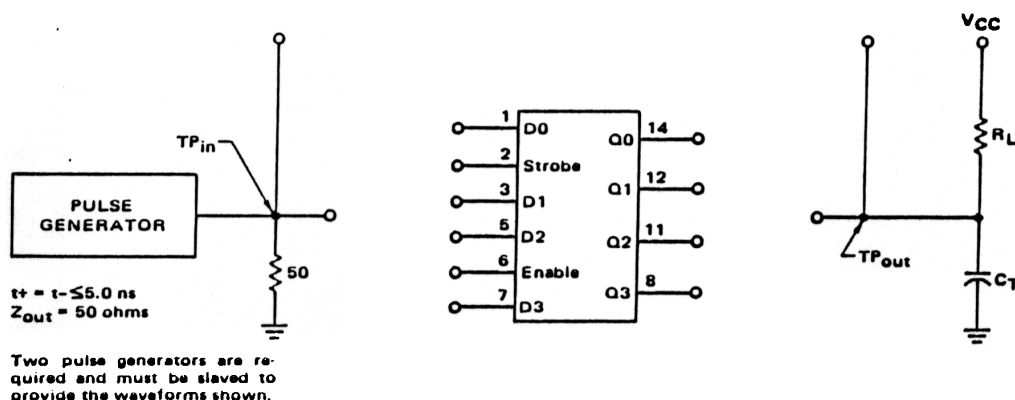
Data Inputs



Enable Inputs



SWITCHING TIME TEST CIRCUIT



R_L value given in Switching Time Test Procedures table.

$C_T = 15 \text{ pF}$ = total parasitic capacitance, which includes probe, wiring, and load capacitances.

High impedance probes ($>1.0 \text{ Megohm}$) must be used.

SWITCHING TIME TEST PROCEDURES ($T_A = 25^\circ\text{C}$)

(Letters shown in test columns refer to waveforms.)

TEST	SYMBOL	PIN UNDER TEST (In/Out)	INPUT			OUTPUT Pin 14 D0	R_L Ohms	LIMITS (ns) Max
			Pin 1 D0	Pin 2 Strobe	Pin 6 Enable			
Strobe Propagation Delay	$t_{\text{pd}+1}$	2/14	T	S	2.4 V	U	510	25
	$t_{\text{pd}-1}$	2/14	T	S	2.4 V	U	510	40
	$t_{\text{pd}+2}$	2/14	T	S	2.4 V	U	5.0 k	50
	$t_{\text{pd}-2}$	2/14	T	S	2.4 V	U	5.0 k	34
Rise Time	t^+	14	T	S	2.4 V	U	510 or 5.0 k	0.3 RC
Fall Time	t^-	14	T	S	2.4 V	U	510	9.0
Data Propagation Delay	$t_{\text{pd}+3}$	1/14	V	2.4 V	2.4 V	W	510	20
	$t_{\text{pd}-3}$	1/14	V	2.4 V	2.4 V	W	510	30
	$t_{\text{pd}+4}$	1/14	V	2.4 V	2.4 V	W	5.0 k	50
	$t_{\text{pd}-4}$	1/14	V	2.4 V	2.4 V	W	5.0 k	25
Enable Propagation Delay	$t_{\text{pd}+3}$	1/14	X	2.4 V	Y	Z	510	20
	$t_{\text{pd}-3}$	1/14	X	2.4 V	Y	Z	510	30
	$t_{\text{pd}+4}$	1/14	X	2.4 V	Y	Z	5.0 k	50
	$t_{\text{pd}-4}$	1/14	X	2.4 V	Y	Z	5.0 k	25
Minimum Strobe Enable	—	1/14	T ①	1.8 V	2.4 V	②	5.0 k	②
Maximum Strobe Inhibit	—	1/14	T ①	1.0 V	2.4 V	③	5.0 k	③

① Pulse T conditions changed: $V_L = 1.0 \text{ V}$, $V_H = 1.8 \text{ V}$

② Output shall follow data input.

③ Output shall not toggle.

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