

CD54HC174/3A CD54HCT174/3A

Switching Speed (Limits with black dots (•) are tested 100%.)

SWITCHING CHARACTERISTICS ($C_L = 50$ pF, Input $t_r, t_f = 6$ ns)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS V_{CC} V	LIMITS								UNITS	
			25°C				-55°C to +125°C					
			HC		HCT		54HC		54HCT			
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
Propagation Delay Clock to Q	t_{PLH}	2	—	165	—	—	—	—	250	—	—	ns
		4.5	—	33•	—	40•	—	50•	—	60•		
		6	—	28	—	—	—	43	—	—		
		2	—	150	—	—	—	225	—	—		
\overline{MR} to Q	t_{PHL}	4.5	—	30•	—	44•	—	45•	—	66•		
		6	—	26	—	—	—	38	—	—		
		2	—	75	—	—	—	110	—	—		
Output Transition Time	t_{TLH}	4.5	—	15	—	15	—	22	—	22		
		6	—	13	—	—	—	19	—	—		
		—	—	—	—	—	—	—	—	—		
Input Capacitance	C_i	—	—	10	—	10	—	10	—	10	pF	

Burn-In Test-Circuit Connections (Use Static II for /3A burn-in and Dynamic for Life Test.)

Static	STATIC BURN-IN I			STATIC BURN-IN II		
	OPEN	GROUND	V_{CC} (6V)	OPEN	GROUND	V_{CC} (6V)
CD54HC/HCT174	2,5,7,10, 12,15	1,3,4,6,8,9,11,13, 14	16	2,5,7,10, 12,15	8	1,3,4,6,9,11,13, 14,16
Dynamic	OPEN	GROUND	$1/2 V_{CC}$ (3V)	V_{CC} (6V)	OSCILLATOR	
CD54HC/HCT174	—	8	2,5,7,10,12,15	1,16	50 kHz	25 kHz
					9	3,4,6,11,13,14

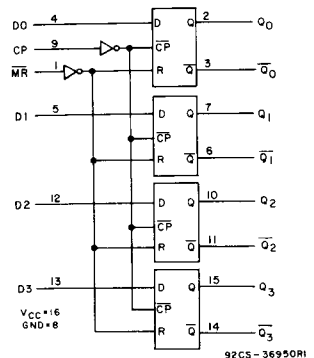
NOTE: Each pin except V_{CC} and Gnd will have a resistor of 2k-47k ohms.

Quad D-Type Flip-Flop w/RESET

The RCA CD54HC175 and the CD54HCT175 are high-speed quad D-type flip-flops with individual D inputs and Q, \overline{Q} complementary outputs. The devices are fabricated using silicon-gate CMOS technology. They have the low power consumption advantage of standard CMOS ICs and the ability to drive 10 LSTTL devices.

Information at the D input is transferred to the Q and \overline{Q} outputs on the positive-going edge of the clock pulse. All four flip-flops are controlled by a common clock (CP) and a common reset (\overline{MR}). Resetting is accomplished by a low voltage level independent of the clock. All four Q outputs are reset to a logic 0 and all four \overline{Q} outputs to a logic 1.

CD54HC175/3A CD54HCT175/3A



FUNCTIONAL DIAGRAM

Package Specifications

See Section 11, Fig. 11

CD54HC175/3A CD54HCT175/3A

Static Electrical Characteristics (Limits with black dots (•) are tested 100%)

CHARACTERISTICS		TEST CONDITIONS								UNITS
		HC/HCT				V _{IN}		LIMITS		
		V _{DD}	V _O	I _O	V _{CC} or GND	V _{IL} or V _{IH}	V _{IL} or V _{IH}	MIN.	MAX.	
Quiescent Device Current I _{CC}	25°C	6	—	—	6, 0	—	—	—	8•	μA
	-55°C	6	—	—	6, 0	—	—	—	160•	
	+125°C									

The complete static electrical test specification consists of the above by-type static tests combined with the standard static tests in the beginning of this section.

HCT INPUT LOADING TABLE

INPUT	UNIT LOAD*
MR	1.0
D	0.15
CP	0.6

*Unit load is ΔI_{CC} limit specified in Static Characteristics Chart, e.g., 360 μA max. @ 25°C.

Switching Speed (Limits with black dots (•) are tested 100%.)

SWITCHING CHARACTERISTICS (C_L = 50 pF, Input t_r, t_f = 6 ns)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS V _{CC} V	LIMITS								UNITS
			25°C				-55°C to +125°C				
			HC		HCT		54HC		54HCT		
Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.				
Propagation Delay Clock to Q or \bar{Q}	t _{PLH} t _{PHL}	2	—	175	—	—	—	265	—	—	ns
		4.5	—	35•	—	33•	—	53•	—	50•	
		6	—	30	—	—	—	45	—	—	
MR to Q or \bar{Q}	t _{PLH} t _{PHL}	2	—	175	—	—	—	265	—	—	
		4.5	—	35•	—	40•	—	53•	—	60•	
		6	—	30	—	—	—	45	—	—	
Output Transition Time	t _{TLH} t _{THL}	2	—	75	—	—	—	110	—	—	
		4.5	—	15	—	15	—	22	—	22	
		6	—	13	—	—	—	19	—	—	
Input Capacitance	C _i	—	—	10	—	10	—	10	—	10	pF

Burn-In Test-Circuit Connections (Use Static II for /3A burn-in and Dynamic for Life Test.)

Static	STATIC BURN-IN I			STATIC BURN-IN II		
	OPEN	GROUND	V _{CC} (6V)	OPEN	GROUND	V _{CC} (6V)
CD54HC/HCT175	2,3,6,7,10, 11,14,15	1,4,5,8,9,12,13	16	2,3,6,7,10, 11,14,15	8	1,4,5,9,12,13,16
Dynamic	OPEN	GROUND	1/2 V _{CC} (3V)	V _{CC} (6V)	OSCILLATOR	
CD54HC/HCT175	—	8	2,3,6,7,10, 11,14,15	1,16	50 kHz	25 kHz
					9	4,5,12,13

NOTE: Each pin except V_{CC} and Gnd will have a resistor of 2k-47k ohms.