

CD54HC195/3A CD54HCT195/3A

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 CP to Output	t_{PLH} t_{PHL}	2	—	175	—	—	—	265	—	—	ns
		4.5	—	35•	—	35•	—	53•	—	53•	
		6	—	30	—	—	—	45	—	—	
Propagation Delay MR to Output	t_{PHL} t_{PLH}	2	—	150	—	—	—	225	—	—	
		4.5	—	30•	—	35•	—	45•	—	53•	
		6	—	26	—	—	—	38	—	—	
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	

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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/HCT195	11-15	1-10	16	11-15	8	1-7,9,10,16
Dynamic	OPEN	GROUND	$1/2 V_{CC}$ (3V)	V_{CC} (6V)	OSCILLATOR	
CD54HC/HCT195	—	8,9	11-15	1-3,16	50 kHz	25 kHz

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

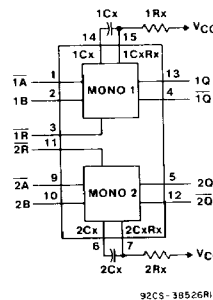
Dual Monostable Multivibrator w/RESET

CD54HC221/3A CD54HCT221/3A

The RCA CD54HC221 and CD54HCT221 are dual monostable multivibrators with reset. An external resistor (R_x) and an external capacitor (C_x) control the timing and the accuracy for the circuit. Adjustment of R_x and C_x provides a wide range of output pulse widths from the Q and \bar{Q} terminals. Pulse triggering on the B input occurs at a particular voltage level and is not related to the rise and fall time of the trigger pulse.

Once triggered, the outputs are independent of further trigger inputs on \bar{A} and B. The output pulse can be terminated by a LOW level on the Reset (\bar{R}) pin. Trailing-edge-triggering (\bar{A}) and leading-edge-triggering (B) inputs are provided for triggering from either edge of the input pulse. On power up, the IC is reset. If either Mono is not used, each input (on the unused device) must be terminated either high or low.

The minimum value of external resistance, R_x , is typically 500 Ω . The minimum value of external capacitance, C_x , is 0 pF. The calculation for the pulse width is $t_w = 0.7 R_x C_x$ at $V_{CC} = 4.5$ V.



FUNCTIONAL DIAGRAM

Package Specifications

See Section 11, Fig. 11

CD54HC221/3A CD54HCT221/3A

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	HC V _{IL} or V _{IH}	HCT 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	6	—	—	6, 0	—	—	—	160•	

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*
All	0.3

*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	V _{CC} V	25°C				-55°C to +125°C				UNITS
			HC		HCT		54HC		54HCT		
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Propagation Delay, Trigger A, B, R to Q	t _{PLH}	2	—	210	—	—	—	315	—	—	ns
		4.5	—	42•	—	42•	—	63•	—	63•	
		6	—	36	—	—	—	54	—	—	
A, B, R to Q̄	t _{PHL}	2	—	170	—	—	—	255	—	—	ns
		4.5	—	34	—	34	—	51	—	51	
		6	—	29	—	—	—	43	—	—	
Propagation Delay R to Q	t _{PLH}	2	—	160	—	—	—	240	—	—	ns
		4.5	—	32	—	38	—	48	—	57	
		6	—	27	—	—	—	41	—	—	
R to Q̄	t _{PHL}	2	—	180	—	—	—	270	—	—	ns
		4.5	—	36•	—	37•	—	54•	—	56•	
		6	—	31	—	—	—	46	—	—	
Output Transition Time	t _{TLH} t _{THL}	2	—	75	—	—	—	110	—	—	ns
		4.5	—	15	—	15	—	22	—	22	
		6	—	13	—	—	—	19	—	—	
Input Capacitance	C _I	—	—	10	—	10	—	10	—	10	pF
Pulse Width match between circuits in the same package C _x = 1000 pF, R _x = 10k Ω		4.5 to 5.5	Typical ±2		Typical ±2		—	—	—	—	%

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/HCT221	4-7,12-15	1-3,8-11	16	4-7,12-15	8	1-3,9-11,16
Dynamic	OPEN	GROUND	1/2 V _{CC} (3V)	V _{CC} (6V)	OSCILLATOR 50 kHz 25 kHz	
CD54HC/HCT221	—	1,6,8,9,14	4,5,12,13	7,15,16	2,3,10,11	—

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