

CMOS LOGIC CIRCUITS

TYPES TF4042A, TP4042A QUAD D-TYPE LATCHES SEPTEMBER 1975

- Designed to be Interchangeable with RCA CD4042A
- Control and Polarity Inputs
- Complementary Outputs

description

The '4042A is a quadruple D-type latch with common control and polarity inputs, C and P. Complementary buffered outputs are available from each latch.

When P is high, C determines the state of all the latches. If C is high, the latches pass data from their D inputs to their Q outputs and the data complement to their $\bar{Q}$ outputs. If C is low, the data is latched.

When P is low, C still determines the state of all the latches, but now data is passed when C is low and is latched when C is high.

FUNCTION TABLE

P	C	FUNCTION
H	H	Pass data
H	L	Latch data
L	H	Latch data
L	L	Pass data

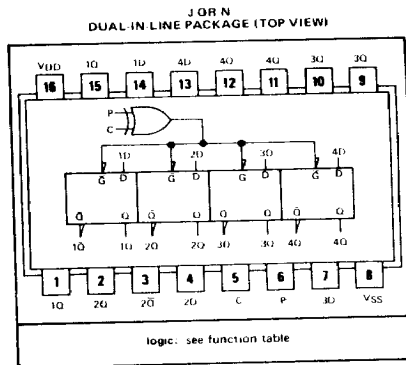
H = high level, L = low level

specifications

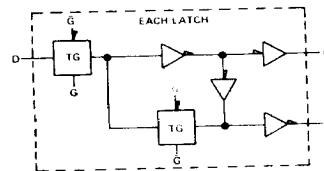
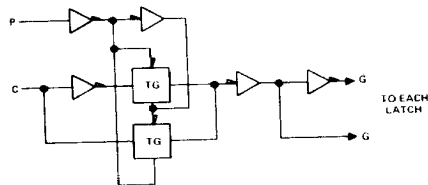
MAXIMUM RATINGS	RECOMMENDED OPERATING CONDITIONS	ELECTRICAL CHARACTERISTICS
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recommended operating conditions

recommended operating conditions									
	TF4042A				TP4042A				UNIT
	V _{DD} = 5 V		V _{DD} = 10 V		V _{DD} = 5 V		V _{DD} = 10 V		
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
Width of control pulse (high or low), t _{w(control)}	250	75	350	175	ns				
Data setup time before latching, t _{su(data)}	100	50	125	60	ns				



functional block diagram



TYPES TF4042A, TP4042A **QUAD D-TYPE LATCHES**

electrical characteristics

$V_{DD} = 5\text{ V and } 10\text{ V}$

PARAMETER	TEST CONDITIONS†		TF4042A		TM042A		UNIT
			V _{DD} = 5 V		V _{DD} = 10 V		
			MIN	MAX	MIN	MAX	
I _{DD} or Quiescent supply current $-I_{SS}$	V _I = V _{DD} or 0, T _A = MIN, or 25°C		1	2	10	20	μA
	No load, T _A = MAX		60	120	140	280	

$V_{DD} = 15\text{ V}$

PARAMETER	TEST CONDITIONS†		TF4042A		TP4042A		UNIT
			MIN	MAX	MIN	MAX	
I_{DD} or Quiescent supply current $-I_{SS}$	$V_I = V_{DD}$ or 0,	$T_A = \text{MIN or } 25^\circ\text{C}$	6		60		μA
	No load	$T_A = \text{MAX}$	360		840		

† $T_A = \text{MIN or MAX}$ refers to the respective values of temperature specified under recommended operating conditions.

switching characteristics at 25°C free-air temperature

PARAMETER	TEST CONDITIONS	TF4042A		TP4042A		UNIT
		$V_{DD} = 5\text{ V}$		$V_{DD} = 10\text{ V}$		
		MIN	MAX	MIN	MAX	
t_{PLH} Propagation delay time, low-to-high-level output	$C_L = 50\text{ pF}^\S$, $R_L = 200\text{ k}\Omega$, See Note 1	475	200	600	300	ns
t_{PHL} Propagation delay time, high-to-low-level output		475	200	600	300	ns
t_{TLH} Transition time, low-to-high-level output		350	150	400	220	ns
t_{THL} Transition time, high-to-low-level output		350	150	400	220	ns

[§]With a 15-pF load, these devices switch with times similar to those of the RCA CD4042A.
 NOTE 1: See load circuit and voltage waveforms on page 170.

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