

Recent Additions
CD54AC651/3A
CD54ACT651/3A

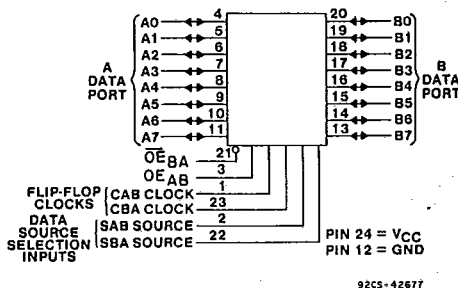
T-52-31

Octal-Bus Transceiver/Register, 3-State
 Inverting

The RCA CD54AC651 and CD54ACT651 are 3-state-octal-bus transceivers/registers that utilize the new RCA ADVANCED CMOS LOGIC technology. The CD54AC651 and CD54ACT651 have inverting outputs. These devices consist of bus transceiver circuits, D-type flip-flops, and control circuitry arranged for multiplexed transmission of data directly from the data bus or from the internal storage registers. Output Enables OE_{AB} and \overline{OE}_{BA} are provided to control the transceiver functions. SAB and SBA control pins are provided to select whether real-time or stored data is transferred. The circuitry used for select control will eliminate the typical decoding glitch that occurs in a multiplexer during the transition between stored and real-time data. A LOW input level selects real-time data, and a HIGH selects stored data. The following examples demonstrate the four fundamental bus-management functions that can be performed with the octal-bus transceivers and registers.

Data on the A or B data bus, or both, can be stored in the internal D flip-flops by low-to-high transitions at the appropriate clock pins (CAB or CBA) regardless of the select or enable control pins. When SAB and SBA are in the real-time transfer mode, it is also possible to store data without using the internal D-type flip-flops by simultaneously enabling OE_{AB} and \overline{OE}_{BA} . In this configuration, each output reinforces its input. Thus, when all other data sources to the two sets of bus lines are at high impedance, each set of bus lines will remain at its last state.

The CD54AC651 and CD54ACT651 are supplied in 24-lead dual-in-line ceramic packages (F suffix).



FUNCTIONAL DIAGRAM

Package Specifications
 (See Section 11, Fig. 15)

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

CHARACTERISTICS	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE (T_A) - °C				UNITS	
				+25		-55 to +125			
				MIN.	MAX.	MIN.	MAX.		
Quiescent Supply Current (MSI)	I_{CC}	V_{CC} or GND	0	5.5	—	8•	—	160•	μA

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.

ACT INPUT LOADING TABLE

INPUT	UNIT LOAD*
CAB, CBA	1.25
SAB, SBA	1.2
OE_{AB}	0.67
\overline{OE}_{BA}	1.17
A_n, B_n	0.4

*Unit load is ΔI_{CC} limit specified in Static Characteristics Chart, e.g., 2.4 mA max. @ 25°C.

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SWITCHING CHARACTERISTICS: AC Series; $t_r, t_f = 3 \text{ ns}$, $C_L = 50 \text{ pF}$ (Worst Case)

CHARACTERISTICS	SYMBOL	V _{CC} (V)	-55 to +125°C		UNITS
			MIN.	MAX.	
Propagation Delays: Store A Data to B Bus Store B Data to A Bus	t _{PLH}	1.5	—	194	ns
	t _{PHL}	3.3*	4	21.7	
		5†	2.7	15.5*	
A Data to B Bus B Data to A Bus	t _{PLH}	1.5	—	178	ns
	t _{PHL}	3.3	3.7	19.9	
		5	2.4	14.2*	
Select to Data	t _{PLH}	1.5	—	194	ns
	t _{PHL}	3.3	4	21.7	
		5	2.7	15.5*	
3-State Enabling/Disabling Time Bus to Output or Register to Output	t _{PZL}	1.5	—	194	ns
	t _{PZH}	3.3	4	23.3	
	t _{PLZ}		2.7	15.5*	
	t _{PHZ}	5			
Power Dissipation Capacitance	C _{PD§}	—			pF
Min. (Valley) V _{OH} During Switching of Other Outputs (Output Under Test Not Switching)	V _{OHV}	5	4 Typ. @ 25°C		V
Max. (Peak) V _{OL} During Switching of Other Outputs (Output Under Test Not Switching)	V _{OLP}	5	4 Typ. @ 25°C		V
Input Capacitance	C _I	—	—	10	pF
3-State Output Capacitance	C _O	—	—	15	pF



SWITCHING CHARACTERISTICS: ACT Series; $t_r, t_f = 3 \text{ ns}$, $C_L = 50 \text{ pF}$ (Worst Case)

CHARACTERISTICS	SYMBOL	V _{CC} (V)	-55 to +125°C		UNITS
			MIN.	MAX.	
Propagation Delays: Store A Data to B Bus Store B Data to A Bus	t _{PLH}	5	2.7	15.5*	ns
	t _{PHL}				
A Data to B Bus B Data to A Bus	t _{PLH}	5†	2.4	14.2*	ns
	t _{PHL}				
Select to Data	t _{PLH}	5	2.7	15.5*	ns
	t _{PHL}				
3-State Enabling/Disabling Time Bus to Output or Register to Output	t _{PZL}	5	2.7	15.5*	ns
	t _{PZH}				
	t _{PLZ}				
	t _{PHZ}				
Power Dissipation Capacitance	C _{PD§}	—			pF
Min. (Valley) V _{OH} During Switching of Other Outputs (Output Under Test Not Switching)	V _{OHV}	5	4 Typ. @ 25°C		V
Max. (Peak) V _{OL} During Switching of Other Outputs (Output Under Test Not Switching)	V _{OLP}	5	1 Typ. @ 25°C		V
Input Capacitance	C _I	—	—	10	pF
3-State Output Capacitance	C _O	—	—	15	pF

*3.3 V: min. is @ 3.6 V
 max. is @ 3 V

†5 V: min. is @ 5.5 V
 max. is @ 4.5 V

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

§C_{PD} is used to determine the dynamic power consumption per package.

For AC, $P_D = V_{CC}^2 C_{PD} f_i + \sum V_{CC}^2 C_L f_o$

For ACT, $P_D = V_{CC}^2 C_L f_i + \sum V_{CC}^2 C_L f_o C_L + V_{CC} \Delta I_{CC}$ where f_i = input frequency
 f_o = output frequency
 C_L = output load capacitance
 V_{CC} = supply voltage