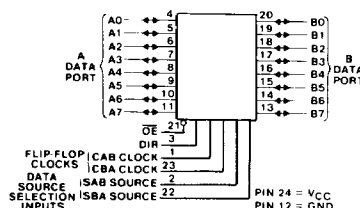


CD54HC646/3A

CD54HCT646/3A

Octal Bus Transceiver/Register, 3-State, Non-Inverting

The RCA CD54HC646 and CD54HCT646 are octal bus transceivers/registers with 3-state non-inverting outputs. These devices are bus transceivers with D-type flip-flops which act as internal storage registers. Data on the A bus or the B bus can be clocked into the registers on the LOW-to-HIGH transition of either CAB or CBA clock inputs. Output enable ($\overline{OE}$) and direction ($\overline{DIR}$) inputs control the transceiver functions. Data present at the high impedance output can be stored in either register or both but only one of the two buses can be enabled as outputs at any one time. The select controls (SAB and SBA) can multiplex stored and transparent (real time) data. The direction control determines which data bus will receive data when the output enable ($\overline{OE}$) is LOW. In the high impedance mode (output enable HIGH), A data can be stored in one register and B data can be stored in the other register. The clocks are not gated with the direction ($\overline{DIR}$) and output enable ($\overline{OE}$) terminals; data at the A or B terminals can be clocked into the storage flip-flops at any time.



92CS-38529

FUNCTIONAL DIAGRAM

Package Specifications

See Section 11, Fig. 15

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

CHARACTERISTICS		TEST CONDITIONS						LIMITS		UNITS
		HC/HCT				V _{IN}				
		V _{DD}	V _O	I _O	V _{CC} or GND	V _{IL} or V _{IH}	V _{OL} or V _{IH}	MIN.	MAX.	
Output High (Source) Current I _{OH} Min. - TTL Load	25°C	4.5	3.98	—	—	0, 4.5	0, 4.5	-6•	—	mA
	-55°C	4.5	3.70	—	—	0, 4.5	0, 4.5	-6•	—	
	+125°C	4.5	—	—	—	0, 4.5	0, 4.5	-6•	—	
Output Low (Sink) Current I _{OL} Min. - TTL Load	25°C	4.5	0.26	—	—	0, 4.5	0, 4.5	6•	—	mA
	-55°C	4.5	0.40	—	—	0, 4.5	0, 4.5	6•	—	
	+125°C	4.5	—	—	—	0, 4.5	0, 4.5	6•	—	
High Level Output Voltage V _{OH} - TTL Load	25°C	4.5	—	-6	—	1.35, 3.15	0.8, 2.0	3.98•	—	V
	-55°C	4.5	—	-6	—	1.35, 3.15	0.8, 2.0	3.70•	—	
	+125°C	4.5	—	-6	—	1.35, 3.15	0.8, 2.0	3.70•	—	
Low Level Output Voltage V _{OL} - TTL Load	25°C	4.5	—	6	—	1.35, 3.15	0.8, 2.0	—	0.26•	V
	-55°C	4.5	—	6	—	1.35, 3.15	0.8, 2.0	—	0.40•	
	+125°C	4.5	—	6	—	1.35, 3.15	0.8, 2.0	—	0.40•	
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.

CD54HC646/3A

CD54HCT646/3A

HCT INPUT LOADING TABLE

INPUT	UNIT LOAD*
$\overline{OE}$	1.3
DIR	0.75
Clock A $\rightarrow$ B, B $\rightarrow$ A	0.6
Select A, Select B	0.45
Inputs A0-A7, B0-B7	0.3

*Unit load is ΔI_{CC} limit specified in Static Characteristics Chart, e.g., 360 μ A 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	t _{PLH} t _{PHL}	2	—	220	—	—	—	330	—	—	ns
Store A data to B bus		4.5	—	44•	—	44•	—	66•	—	66•	
Store B data to B bus		6	—	37	—	—	—	56	—	—	
A data to B bus		2	—	135	—	—	—	205	—	—	
B data to A bus		4.5	—	27•	—	37•	—	41•	—	56•	
		6	—	23	—	—	—	35	—	—	
Select to Data		2	—	170	—	—	—	255	—	—	
		4.5	—	34•	—	46•	—	51•	—	69•	
		6	—	29	—	—	—	43	—	—	
3-State Disabling Time	t _{PLZ} t _{PHZ}	2	—	175	—	—	—	265	—	—	
Bus to Output or		4.5	—	35•	—	35•	—	53•	—	53•	
Register to Output		6	—	30	—	—	—	45	—	—	
3-State Enabling Time	t _{PZL} t _{PZH}	2	—	175	—	—	—	265	—	—	
Bus to Output or		4.5	—	35•	—	45•	—	53•	—	68•	
Register to Output		6	—	30	—	—	—	45	—	—	
Output Transition Time	t _{TLH} t _{THL}	2	—	60	—	—	—	90	—	—	
		4.5	—	12	—	12	—	18	—	18	
		6	—	10	—	—	—	15	—	—	
Input Capacitance	C _i		—	10	—	10	—	10	—	10	pF
3-State Output Capacitance	C _o		—	20	—	20	—	20	—	20	

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/HCT646	4-11	1-3,12-23	24	—	12	1-11,13-24
Dynamic	OPEN	GROUND	$1/2 V_{CC}$ (3V)	V_{CC} (6V)	OSCILLATOR	
					50 kHz	25 kHz
CD54HC/HCT646	—	1-3,12,21,22	4-11	24	23	13-20

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