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HARRIS SEMICOND SECTOR

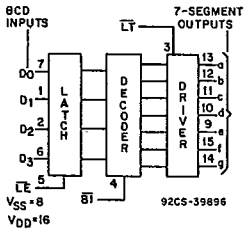
CD54HC4511/3A
CD54HCT4511/3A

BCD-to-7-Segment Latch/Decoder/Driver

T-45-23-29

The RCA CD54HC4511 and CD54HCT4511 are BCD-to-7-segment latch/decoder/drivers having four address inputs (D_0-D_3), active "Low" blanking and lamp test inputs, and a latch enable input which, when "High", enables the latches to store the BCD inputs. When latch enable is "Low", the latches are disabled, making the outputs transparent to the BCD inputs.

These devices have standard-size output transistors but are capable of sourcing (at standard V_{OH} levels) up to 7.5 mA at 4.5 V. The HC types can supply up to 10 mA at 6 V.



FUNCTIONAL DIAGRAM

Package Specifications

See Section 11, Fig. 11

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

CHARACTERISTIC	CD54HC4511 TEST CONDITIONS			CD54HC4511 LIMITS					CD54HCT4511 TEST CONDITIONS		CD54HCT4511 LIMITS					UNITS
				+25°C			-55/+125°C				+25°C			-55/+125°C		
	V_I V	I_O mA	V_{CC} V	Min.	Typ.	Max.	Min.	Max.	V_I V	V_{CC} V	Min.	Typ.	Max.	Min.	Max.	
High-Level Input Voltage V_{IH}			2	1.5	—	—	1.5	—	—	4.5 to 5.5	2•	—	—	2•	—	V
			4.5	3.15•	—	—	3.15•	—								
			6	4.2	—	—	4.2	—								
Low-Level Input Voltage V_{IL}			2	—	—	0.5	—	0.5	—	4.5 to 5.5	—	—	0.8•	—	0.8•	V
			4.5	—	—	1.35•	—	1.35•								
			6	—	—	1.8	—	1.8								
High-Level Output Voltage V_{OH} CMOS Loads	V_{IL} or V_{IH}	-0.02	2	1.9	—	—	1.9	—	V_{IL} or V_{IH}	4.5	4.4•	—	—	4.4•	—	V
			4.5	4.4•	—	—	4.4•	—								
			6	5.9	—	—	5.9	—								
TTL Loads Non-Standard Output	V_{IL} or V_{IH}	-7.5	4.5	3.98•	—	—	3.7•	—	V_{IL} or V_{IH}	4.5	3.98•	—	—	3.7•	—	V
		-10	6	5.48	—	—	5.2	—								
Low-Level Output Voltage V_{OL} CMOS Loads	V_{IL} or V_{IH}	0.02	2	—	—	0.1	—	0.1	V_{IL} or V_{IH}	4.5	—	—	0.1•	—	0.1•	V
			4.5	—	—	0.1•	—	0.1•								
			6	—	—	0.1	—	0.1								
TTL Loads Standard Output	V_{IL} or V_{IH}	4	4.5	—	—	0.26•	—	0.4•	V_{IL} or V_{IH}	4.5	—	—	0.26•	—	0.4•	V
		5.2	6	—	—	0.26	—	0.4								
Input Leakage Current I_I	V_{CC} or Gnd		6	—	—	±0.1•	—	±1•	Any Voltage Between V_{CC} & Gnd	5.5	—	—	±0.1•	—	±1•	μA
Quiescent Device Current I_{CC}	V_{CC} or Gnd	0	6	—	—	8•	—	160•	V_{CC} or Gnd	5.5	—	—	8•	—	160•	μA
Additional Quiescent Device Current per Input Pin: 1 Unit Load ΔI_{CC}*									V_{CC} - 2.1	4.5 to 5.5	—	100	360	—	490	μA

*For dual-supply systems theorectical worst case (V_I = 2.4 V, V_{CC} = 5.5 V) specification is 1.8 mA.

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CD54HC4511/3A
CD54HCT4511/3A

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HCT INPUT LOADING TABLE

INPUT	UNIT LOAD*
$\overline{LT}$, $\overline{LE}$	1.5
$\overline{BI}$, Dn	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	TEST CONDITIONS V_{CC} V	LIMITS 25°C HC Min.	HC Max.	HCT Min.	HCT Max.	-55°C to +125°C 54HC Min.	54HC Max.	54HCT Min.	54HCT Max.	UNITS
Propagation Delay Dn to Output	t_{PLH} t_{PHL}	2	—	300	—	—	—	450	—	—	ns
		4.5	—	60•	—	60•	—	90•	—	90•	
		6	—	51	—	—	—	77	—	—	
$\overline{LE}$ to Output		2	—	270	—	—	—	405	—	—	
		4.5	—	54•	—	54•	—	81•	—	81•	
		6	—	46	—	—	—	69	—	—	
$\overline{BI}$ to Output		2	—	220	—	—	—	330	—	—	
		4.5	—	44•	—	44•	—	66•	—	66•	
		6	—	37	—	—	—	56	—	—	
$\overline{LT}$ to Output		2	—	160	—	—	—	240	—	—	
		4.5	—	32	—	33	—	48	—	50	
		6	—	27	—	—	—	41		—	
Transition Time	t_{THL} t_{TLH}	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 OPEN	GROUND	V_{CC} (6V)	STATIC BURN-IN II OPEN	GROUND	V_{CC} (6V)
CD54HC/HCT4511	9-15	1-8	16	9-15	8	1-7,16
Dynamic	**OPEN**	**GROUND**	**1/2 V_{CC} (3V)**	**V_{CC} (6V)**	**OSCILLATOR 50 kHz**	**25 kHz**
CD54HC/HCT4511	9-15	5,8	—	3,4,16	1,2,7	6

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