■ PERFORMANCE (per gate)

Performance	HD74 Series	HD74S Series
Propagation Delay Time	10 ns	3 ns
Power Dissipation	10 mW	20 mW
Speed-Power Product	100 pJ	60 pJ

■ MAIN CHARACTERISTICS (Ta = −20 ~ +75°C)

Parameter \ Series	HD74 Series min.	HD74 Series max.	HD74S Series min.	HD74S Series max.
V_{OL} (I_{OL} max)	—	0.4V	—	0.5V
V_{OH} (I_{OH} = −400μA)	2.4V	—	2.7V	—
V_{IL}	—	0.8V	—	0.8V
V_{IH}	2V	—	2V	—
I_{IL}	—	−1.6mA	—	−2mA
I_{IH} (V_{IH} min)	—	40μA	—	50μA

■ SELECTION GUIDE

● NAND/NOR/AND/OR GATES

Function	HD74Series	HD74S Series
Quad. 2-input Positive NAND Gates	00	00
Quad. 2-input Positive NAND Gates (with Open Collector Output)	01	—
Quad. 2-input Positive NOR Gates	02	02
Quad. Positive NAND Gates (with Open Collector Output)	03	03
Hex Inverters	04	04
Hex Inverters (with Open Collector Output)	05	05
Hex Inverter Buffers/Drivers (with Open Collector High-voltage Output)	06	—
Hex Buffers/Drivers (with Open Collector High-voltage Output)	07	—
Quad. 2-input Positive AND Gates	08	—
Quad. 2-input Positive AND Gates (with Open Collector Output)	09	—
Triple 3-input Positive NAND Gates	10	10
Triple 3-input Positive AND Gates	—	11
Triple 3-input Positive NAND Gates (with Open Collector Output)	12	12
Dual 4-input Schmitt NAND Gates	13	—
Hex Schmitt-trigger Inverters	14	—
Triple 3-input Positive AND Gates (with Open Collector Output)	—	15
Hex Inverter Buffers/Drivers (with Open Collector High-voltage Output)	16	—
Hex Buffers/Drivers (with Open Collector High-voltage Output)	17	—
Dual 4-input Positive NAND Gates	20	20
Dual 4-input Positive NAND Gates (with Open Collector Output)	22	22
Expandable Dual 4-input Positive NOR Gates (with Strobe)	23	—
Dual 4-input Positive NOR Gates	25	—
Quad. 2-input High-voltage Interface NAND Gates	26	—
Triple 3-input Positive NOR Gates	27	—
8-input Positive NAND Gate	30	—
Quad. 2-input Positive OR Gates	32	—
Quad. 2-input Positive NAND Buffers	37	—
Quad. 2-input Positive NAND Buffers (with Open Collector Output)	38	—
Dual 4-input Positive NAND Buffers	40	40
Quad. Bus Buffer Gates with 3-state Output (Inverting)	125	—
Quad. Bus Buffer Gates with 3-state Output (Noninverting)	126	—
Quad. 2-input Pouitive NAND Schmitt Triggers	132	—
13-input Positive NAND Gate	—	133
12-input Positive NAND Gate (with 3-state Out.)	—	134
Dual 4-input Positive NAND Line Drivers	—	140

(to be continued)

● AND-OR-INVERT GATES

Function	HD74 Series	HD74S Series
Expandable Dual 2-wide 2-input AND-OR-INVERT Gates	50	—
Dual 2-wide 2-input AND-OR-INVERT Gates	51	—
Expandable 4-wide 2-input AND-OR-INVERT Gate	53	—
4-wide 2-input AND-OR-INVERT Gate	54	—
4-2-3-2-input AND-OR-INVERT Gate	—	64
4-2-3-2-input AND-OR-INVERT Gate (with Open Collector Output)	—	65

● EXPANDER

Function	HD74 Series	HD74S Series
Dual 4-input Expanders	60	—

● FLIP FLOPS

Function	HD74 Series	HD74S Series
J-K Master-Flip Flop (AND Inputs)	72	—
Dual J-K Flip Flops	73	—
Dual D-type Edge-triggered Flip Flops	74	74
Dual J-K Flip Flops (with PR and CLR)	76	—
Dual J-K Flip Flops	107	—
Dual J-K Negative-edge-triggered Flip Flops (with PR and CLR)	—	112
Dual J-K Negative-edge-triggered Flip Flops (with PR)	—	113
Dual J-K Negative-edge-triggered Flip Flops (with PR, Common CLR, and Common CK)	—	114
Monostable Multivibrator	121	—
Dual Retriggerable Monostable Multivibrators	123	—
Hex D-type Flip Flops (with CLR)	174	174
Quad. D-type Flip Flops (with CLR)	175	175
Dual Monostable Multivibrators (with Schmitt Trigger)	221	—

● COUNTERS

Function	HD74 Series	HD74S Series
Decade Counter	90A	—
Divide-by-Twelve Counter	92A	—
4-bit Binary Counter	93A	—
Presettable Decade Counter/Latch	176	—
4-bit Binary Counter/Latch	177	—
Synchronous Decade Counter	160	—
Synchronous 4-bit Binary Counter	161	—
Fully Synchronous Decade Counter	162	—
Fully Synchronous 4-bit Binary Counter	163	—
Synchronous Decade Decimal Rate Multiplier	167	—
Synchronous Decade Up/Down Counter	190	—
Synchronous 4-bit Binary Up/Down Counter	191	—
Synchronous Decade Up/Down Counter	192	—
Synchronous 4-bit Binary Up/Down Counter	193	—
Decade Counter	290	—
4-bit Binary Counter	293	—

(to be continued)

TTL HD74/74S Series

● 4-BIT, 5-BIT SHIFT/STORAGE REGISTERS

Function	HD74 Series	HD74S Series
4-bit Right-shift, Left-shift Register	95A	—
5-bit Shift Register (Dual Parallel-in, Parallel-out)	96	—
4-bit D-type Register (with 3-state Output)	173	—
4-bit Parallel-in, Parallel-out Bidirectional Shift Register	194	—
4-bit Parallel-in, Parallel-out Shift Register (J-K Inputs for First Stage)	195	—

● 8-BIT SHIFT REGISTERS

Function	HD74 Series	HD74S Series
8-bit Shift Register	91A	—
8-bit Parallel-out Shift Register	164	—
Parallel-load 8-bit Shift Register	166	—
8-bit Parallel-in, Parallel-out Bidirectional Shift Register	198	—
8-bit Parallel-in, Parallel-out Shift Register (J-K Inputs for First Stage)	199	—

● ENCODERS

Function	HD74 Series	HD74S Series
10-line-to-4-line Priority Encoder	147	—
8-line-to-3-line Priority Encoder	148	—

● DECODERS/DEMULTIPLEXERS

Function	HD74 Series	HD74S Series
BCD-to-Decimal Decoder	42A	—
Excess 3-to-Decimal Decoder	43A	—
Excess 3-Gray-to-Decimal Decoder	44A	—
4-line-to-16-line Decoder/Demultiplexer	154	—
Dual 2-line-to-4-line Decoders/Demultiplexers	155	—
Dual 2-line-to-4-line Decoders/Demultiplexers (with Open Collector Output)	156	—
4-line-to-16-line Decoder/Demultiplexer (with Open Collector Output)	159	—

● DECODERS/LAMP DRIVERS/BUFFERS

Function	HD74 Series	HD74S Series
BCD-to-Decimal Decoder/Driver/(with 30V Out.)	45	—
BCD-to-Decimal Decoder/Driver (with 15V Out.)	145	—
BCD-to-Seven Segment Decoder/Driver (with 30V Output)	46A	—
BCD-to-Seven Segment Decoder/Driver (with 15V Output)	47A	—
BCD-to-Decimal Decoder/Driver (with 60V Out.)	141	—

● LATCHES

Function	HD74 Series	HD74S Series
Quad. Bistable Latches	75	—
Quad. $\overline{S}$-$\overline{R}$ Latches	279	—

● RANDOM ACCESS MEMORIES (less than 256-bit)

Function	HD74 Series	HD74S Series
64-bit Random Access Memory (16w by 4b)	89	—

(to be continued)

● ARITHMETIC ELEMENTS

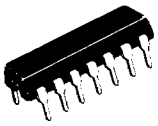
Function	HD74 Series	HD74S Series
4-bit Binary Full Adder	83A	—
4-bit Magnitude Comparator	85	—
Quad. 2-input Exclusive-OR Gates	86	86
Quad. Exclusive-OR/NOR Gates	—	135
Quad. 2-input Exclusive-OR Gates (with Open Collector Output)	136	—
8-bit Odd/Even Parity Generator/Checker	180	—
4-bit Arithmetic Logic Unit/Function Generator	—	181
Look-Ahead Carry Generator (for ALU)	182	182
Dual Carry Save Full Adders	H183	—
9-bit Odd/Even Parity Generator/Checker	—	280
4-bit Binary Full Adder (with Fast Carry)	283	—

● DATA SELECTORS/MULTIPLEXERS

Function	HD74 Series	HD74S Series
16-bit Data Selector/Multiplexer	150	—
8-bit Data Selector/Multiplexer (with Strobe)	151A	151
8-bit Data Selector/Multiplexer	—	—
Dual 4-line-to-1-line Data Selectors/Multiplexers	153	—
Quad. 2-line-to-1-line Data Selectors/Multiplexers	157	157
Quad. 2-line-to-1-line Data Selectors/Multiplexers	—	158
8-bit Data Selector/Multiplexer (with Stobe and 3-state Output)	251	251
Quad. 2-line-to-1-line Data Selectors/Multiplexers (with 3-state Output)	—	257
Quad. 2-line-to-1-line Data Selectors/Multiplexers (with 3-state Output)	—	258

■ OUTLINE

DP-14



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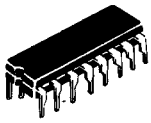

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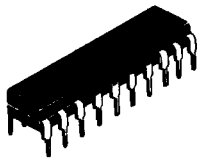

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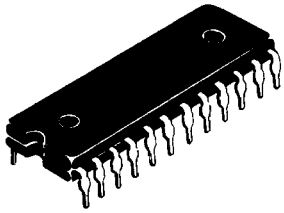

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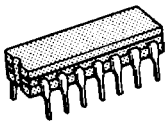

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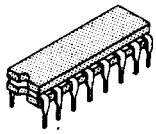

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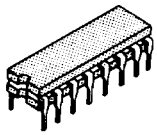

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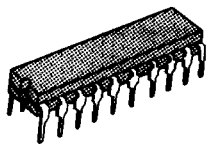
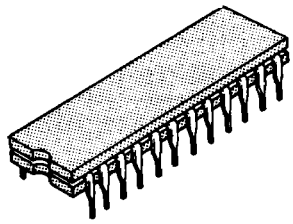
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