# TTL HD74/HD74S Series

### ■ 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

### $\blacksquare$ MAIN CHARACTERISTICS ( $T_8 = -20 \sim +75^{\circ}$ C)

	Series	HD74	Series	HD74S	Series
Parameter		min.	max.	min.	max.
Vol(Iol max)		_	0.4V	_	0.5V
$V_{OH}(I_{OH}=-400\mu\text{A})$		2.4V	_	2.7V	_
$V_{IL}$		_	0.8V	_	0.8V
$V_{IH}$ -		2V	_	2V	_
$I_{IL}$		-	-1.6mA	_	-2mA
I <sub>IH</sub> (V <sub>IH</sub> 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	<del></del>	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	_ <del>_</del>
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. S-R Latches	279	

### ● RANDOM ACCESS MEMORIES (less than 256-bit)

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

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### • ARITHMETIC ELEMENTS

Function	HD74 Series	HD74S Series
4-bit Binary Full Adder	83A	_
4-bit Magnitude Comparator	85	<u> </u>
Quad. 2-input Exclusive-OR Gates	86	86
Quad. Exclusive-OR/NOR Gates	<del>-</del>	135
Quad. 2-input Exclusive-OR Gates (with Open Collector Output)	136	_
8-bit Odd/Even Parity Generator/Checker	180	<del>-</del>
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	<del>-</del>	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

# DP-14 DP-16 DP-20 DP-24 DP-24 DP-24 DP-24 DP-24 DP-20 DP-24 DP-24 DP-24