

92D 10549 D T-45-23-17

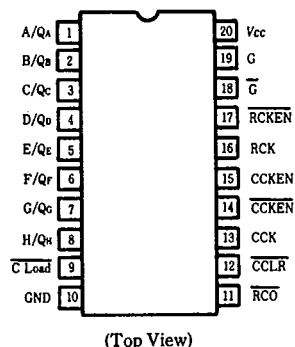
HD74HC593 • 8-bit Register/Binary Counter (with 3-state I/O)

The HD74HC593 consists of a parallel input, 8-bit storage register feeding an 8-bit binary counter. Both the register and the counter have individual positive edge-triggered clocks. In addition, the counter has direct load and clear functions. Expansion is easily accomplished by connecting RCO of the first stage to the count enable of the second stage, etc.

The HD74HC593 has 3-state I/O, which provides parallel counter outputs.

FEATURES

- High Speed Operation
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC}=2\sim 6V$
- Low Input Current: $1\mu A$ max.
- Low Quiescent Supply Current: I_{CC} (static) = $4\mu A$ max. ($T_a=25^\circ C$)

PIN ARRANGEMENT**FUNCTION TABLE**

Inputs									Function
G	$\bar{G}$	CCLR	CCKEN	$\overline{CCKEN}$	CCK	Cload	RCKEN	RCK	
L	H	x	x	x	x	x	x	x	All Q buses are high impedance state
H	x	x	x	x	x	x	x	x	Counter enabled
x	L	x	x	x	x	x	x	x	Counter clear
x	x	H	x	x	x	L	x	x	Q bus data are loaded into counter
x	x	H	H	x		H	x	x	Count up
x	x	H	x	L		H	x	x	Count up
x	x	H	H	x		H	x	x	No count
x	x	H	x	L		H	x	x	No count
x	x	H	L	H	x	H	x	x	No count
x	x	x	x	x	x	x	H	x	No change in register
x	x	x	x	x	x	x	L		No change in register
x	x	x	x	x	x	x	L		Q bus data are stored into register

ABSOLUTE MAXIMUM RATINGS

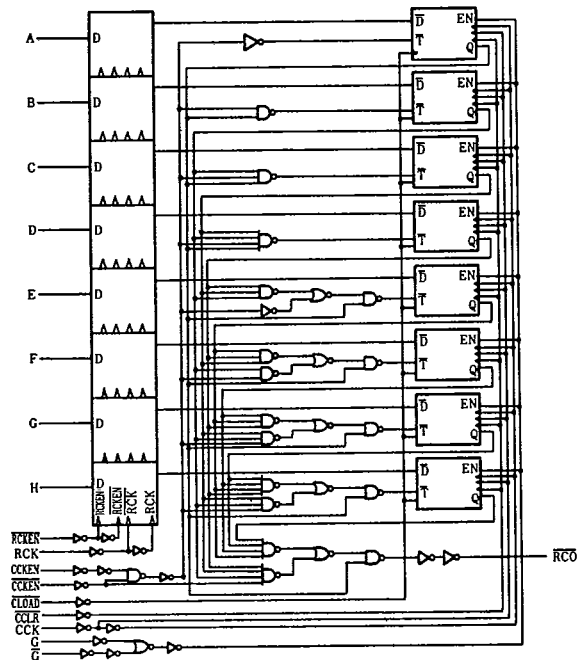
Item	Symbol	Rating	Unit
Supply Voltage Range	V_{CC}	$-0.5 \sim +7.0$	V
Input Voltage	V_{IN}	$-0.5 \sim V_{CC} + 0.5$	V
Output Voltage	V_{OUT}	$-0.5 \sim V_{CC} + 0.5$	V
Output Current	I_{OUT}	± 35	mA
DC Current Drain per V_{CC} , GND	I_{CC}, I_{AND}	± 75	mA
DC Input Diode Current	I_{IK}	± 20	mA
DC Output Diode Current	I_{OK}	± 20	mA
Power Dissipation per Package	P_r	500	mW
Storage Temperature	T_{stg}	$-65 \sim +150$	$^\circ C$

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■ LOGIC DIAGRAM



■ DC CHARACTERISTICS

■ DC CHARACTERISTICS										
Item	Symbol	V _{CC} (V)	Test Conditions		T _a =25°C			T _a =-40~+85°C		Unit
					min.	typ.	max.	min.	max.	
Input Voltage	V _{IH}	2.0			1.5	—	—	1.5	—	V
		4.5			3.15	—	—	3.15	—	
		6.0			4.2	—	—	4.2	—	
	V _{IL}	2.0			—	—	0.5	—	0.5	V
		4.5			—	—	1.35	—	1.35	
		6.0			—	—	1.8	—	1.8	
Output Voltage	V _{OH}	2.0	Q _A ~Q _H V _{is} = V _{IH} or V _{IL}	I _{OH} =-20μA	1.9	2.0	—	1.9	—	V
		4.5			4.4	4.5	—	4.4	—	
		6.0			5.9	6.0	—	5.9	—	
		4.5		I _{OH} =-6mA	4.18	—	—	4.13	—	
		6.0		I _{OH} =-7.8mA	5.68	—	—	5.63	—	
		6.0								
	V _{OL}	2.0	Q _A ~Q _H V _{is} = V _{IH} or V _{IL}	I _{OL} =20μA	—	0.0	0.1	—	0.1	V
		4.5			—	0.0	0.1	—	0.1	
		6.0			—	0.0	0.1	—	0.1	
		4.5		I _{OL} =6mA	—	—	0.26	—	0.33	
		6.0		I _{OL} =7.8mA	—	—	0.26	—	0.33	
		6.0								
Output Voltage	V _{OH}	2.0	RCO V _{is} = V _{IH} or V _{IL}	I _{OH} =-20μA	1.9	2.0	—	1.9	—	V
		4.5			4.4	4.5	—	4.4	—	
		6.0			5.9	6.0	—	5.9	—	
		4.5		I _{OH} =-4mA	4.18	—	—	4.13	—	
		6.0		I _{OH} =-5.2mA	5.68	—	—	5.63	—	
		6.0								
	V _{OL}	2.0	RCO V _{is} = V _{IH} or V _{IL}	I _{OL} =20μA	—	0.0	0.1	—	0.1	V
		4.5			—	0.0	0.1	—	0.1	
		6.0			—	0.0	0.1	—	0.1	
		4.5		I _{OL} =4mA	—	—	0.26	—	0.33	
		6.0		I _{OL} =5.2mA	—	—	0.26	—	0.33	
		6.0								

(to be continued)

(to be continued)

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Item	Symbol	V _{CC} (V)	Test Conditions	T _a =25°C			T _a =-40~+85°C		Unit
				min.	typ.	max.	min.	max.	
Off-state Output Current	I _{OZ}	6.0	V _{is} = V _{IH} or V _{IL} , V _{out} = V _{CC} or GND	—	—	±0.5	—	±5.0	μA
Input Current	I _{is}	6.0	V _{is} = V _{CC} or GND	—	—	±0.1	—	±1.0	μA
Quiescent Supply Current	I _{CC}	6.0	V _{is} = V _{CC} or GND, I _{out} = 0μA	—	—	4.0	—	40	μA

■ AC CHARACTERISTICS (C_L=50pF, Input t_r=t_f=6ns)

Item	Symbol	V _{CC} (V)	Test Conditions	T _a =25°C			T _a =-40~+85°C		Unit
				min.	typ.	max.	min.	max.	
Maximum Clock Frequency	f _{max}	2.0		—	—	5	—	4	MHz
		4.5		—	—	25	—	20	
		6.0		—	—	29	—	24	
Propagation Delay Time	t _{PLH} t _{PHL}	2.0	CCK to Q	—	—	200	—	250	ns
		4.5		—	—	40	—	50	
		6.0		—	—	34	—	43	
	t _{PLH} t _{PHL}	2.0	CLoad to Q	—	—	200	—	250	ns
		4.5		—	—	40	—	50	
		6.0		—	—	34	—	43	
	t _{PHL}	2.0	CCLR to Q	—	—	200	—	250	ns
		4.5		—	—	40	—	50	
		6.0		—	—	34	—	43	
Output Enable Time	t _{ZH} t _{ZL}	2.0		—	—	150	—	190	ns
		4.5		—	—	30	—	38	
		6.0		—	—	26	—	33	
Output Disable Time	t _{LZ} t _{HZ}	2.0		—	—	150	—	190	ns
		4.5		—	—	30	—	38	
		6.0		—	—	26	—	33	
Output Rise/Fall Time	t _{TLH} t _{THL}	2.0	Q	—	—	60	—	75	ns
		4.5		—	—	12	—	15	
		6.0		—	—	10	—	13	
	t _{TLH} t _{THL}	2.0	RCO	—	—	75	—	95	ns
		4.5		—	—	15	—	19	
		6.0		—	—	13	—	16	
Input Capacitance	C _{is}	—		—	5	10	—	10	pF

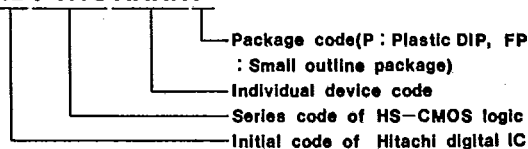
PACKAGE INFORMATION

T-90-20

In the HD74HC series of HS-CMOS logic, either of plastic DIP and small outline packages can be selected.
For your ordering, please refer to the following package code.

● Package code of HS-CMOS Logic

HD74HC XXXXP

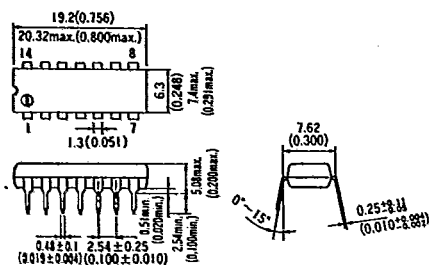


■ PLASTIC DIP PACKAGE [Unit: mm (inch), scale: 1/1]

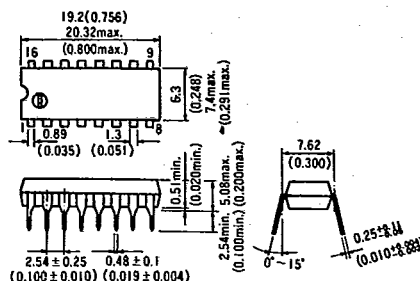
● 14-pin type

● 16-pin type

DP-14



DP-16

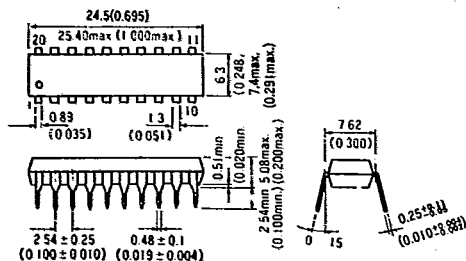


Note) For the present, both packages of 0.89 and 1.3 can be used. Please refer to the Technical Marketing Dept. for further details.

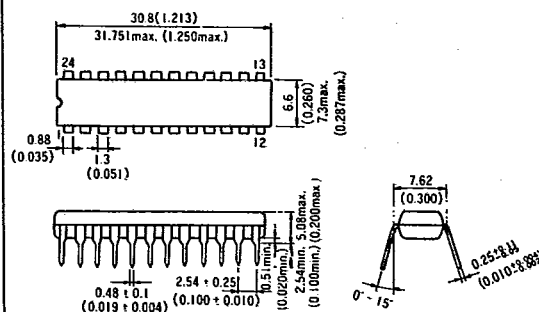
● 20-pin type

● 24-pin type

DP-20N



DP-24N



Note) Because this is under development, the dimensions may be changed partly.

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F-06



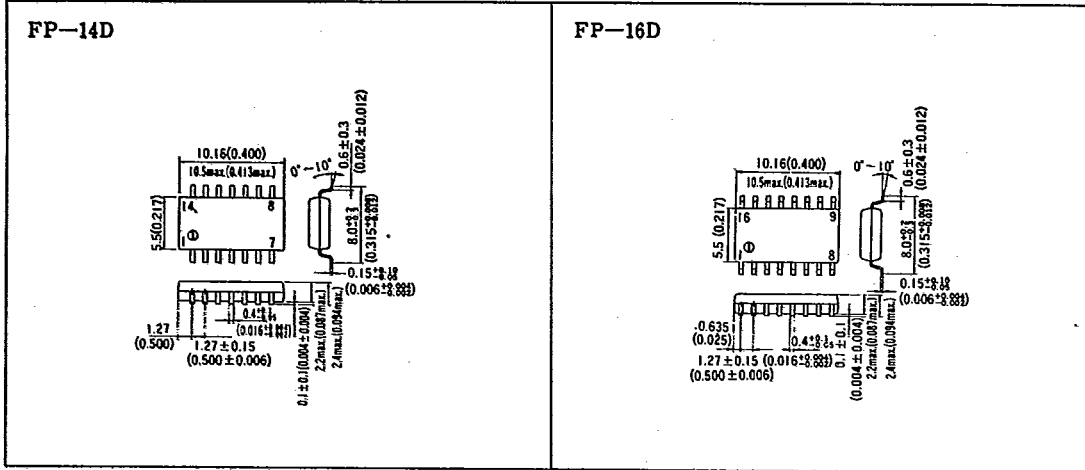
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■ SMALL OUTLINE PACKAGE [Unit: mm (inch), scale: 1½]

● 14-pin type

● 16-pin type



● 20-pin type

