

HD14014B

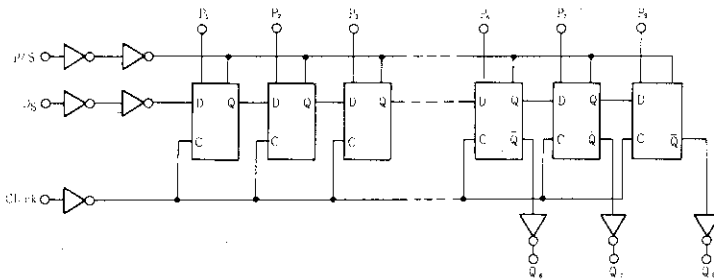
8-bit Static Shift Register

The HD14014B 8-bit shift register finds primary use in parallel-to-serial data conversion, synchronous parallel input, serial output data queuing; and other general purpose register applications requiring low power and/or high noise immunity.

FEATURES

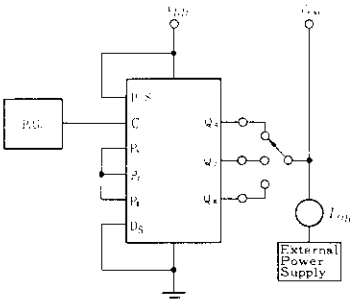
- Quiescent Current = 5nA/pkg typ @5V
- Full Static Operation from DC to 7MHz
- Supply Voltage Range = 3 to 18V
- Capable of Driving One Low-power Schottky TTL Load Over the Rated Temperature Range
- Pin-for-Pin Replacement for CD4014B and MC14014B

LOGIC DIAGRAM

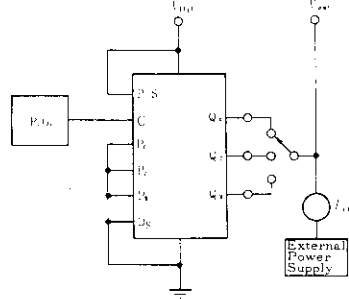


DC CHARACTERISTIC TEST CIRCUIT

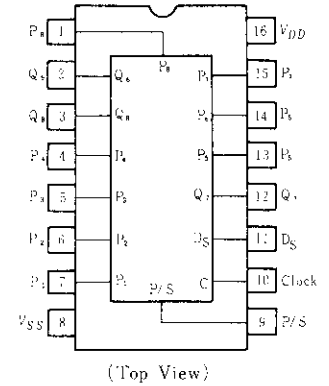
● I_{OH}



● I_{OL}



PIN ARRANGEMENT



TRUTH TABLE

Serial Operation

t	Clock	D _n	P/S
n		0	0
n+1		1	0
n+2		0	0
n+3		1	0
		x	0

Q _n t = n+6	Q _{n+1} t = n+7	Q _{n+2} t = n+8
0	?	?
1	0	?
0	1	0
1	0	1
Q _n	Q _{n+1}	Q _{n+2}

Parallel Operation

Clock	D _n	P/S	D _m	Q _m *
	x	1	0	0
	x	1	1	1

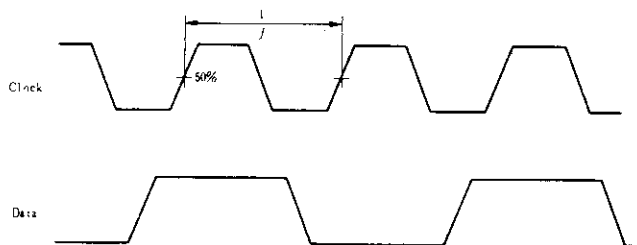
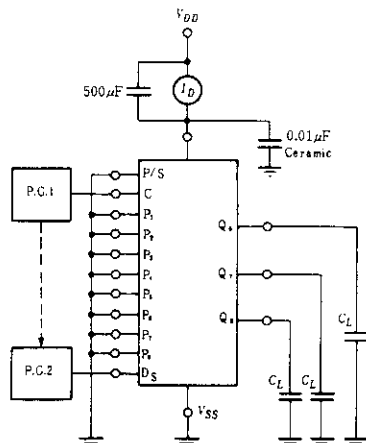
* : Q_n, Q_{n+1}, & Q_{n+2} are available externally
 x : Don't Care

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Test Conditions	-40°C		25°C			85°C		Unit	
			min	max	min	typ	max	min	max		
Output Voltage	V_{OL}	$V_{DD}(V)$									
		5.0	—		0.05	—	0	0.05	—	0.05	V
		10	—		0.05	—	0	0.05	—	0.05	
	15	—		0.05	—	0	0.05	—	0.05		
	V_{OH}	$V_{in}=V_{DD}$ or 0									
		5.0	4.95	—	4.95	5.0	—	4.95	—	V	
10		9.95	—	9.95	10	—	9.95	—			
15	14.95	—	14.95	15	—	14.95	—				
Input Voltage	V_{IL}	$V_{out}=4.5$ or 0.5V	—	1.5	—	2.25	1.5	—	1.5	V	
		$V_{out}=9.0$ or 1.0V	—	3.0	—	4.50	3.0	—	3.0		
		$V_{out}=13.5$ or 1.5V	—	4.0	—	6.75	4.0	—	4.0		
	V_{IH}	$V_{out}=0.5$ or 4.5V	3.5	—	3.5	2.75	—	3.5	—	V	
		$V_{out}=1.0$ or 9.0V	7.0	—	7.0	5.50	—	7.0	—		
		$V_{out}=1.5$ or 13.5V	11.0	—	11.0	8.25	—	11.0	—		
Output Drive Current	I_{OH}	$V_{OH}=2.5V$	-1.0	—	-0.8	-1.7	—	-0.6	—	mA	
		$V_{OH}=4.6V$	-0.2	—	-0.16	-0.36	—	-0.12	—		
		$V_{OH}=9.5V$	-0.5	—	-0.4	-0.9	—	-0.3	—		
	I_{OL}	$V_{OH}=13.5V$	-1.4	—	-1.2	-3.5	—	-1.0	—		
		$V_{OL}=0.4V$	0.52	—	0.44	0.88	—	0.36	—	mA	
		$V_{OL}=0.5V$	1.3	—	1.1	2.25	—	0.9	—		
$V_{OL}=1.5V$	3.6	—	3.0	8.8	—	2.4	—				
Input Current	I_{in}	15	—	± 0.3	—	± 0.00001	± 0.3	—	± 1.0	μA	
Input Capacitance	C_{in}		$V_{in}=0$	—	—	—	5.0	7.5	—	pF	
Quiescent Current	I_{DD}	5.0	Zero Signal, per Package	—	20	—	0.005	20	—	150	μA
		10		—	40	—	0.010	40	—	300	
		15		—	80	—	0.015	80	—	600	
Total Supply Current*	I_T	5.0	Dynamic + I_{DD} ,	—	—	—	0.76	—	—	μA	
		10	per Gate,	—	—	—	1.51	—	—		
		15	$C_L=50pF, f=1kHz$	—	—	—	2.27	—	—		

* To calculate total supply current at frequency other than 1kHz.
 @ $V_{DD}=5.0V$ $I_T=(0.75\mu A/kHz)f+I_{DD}$. @ $V_{DD}=10V$ $I_T=(1.50\mu A/kHz)f+I_{DD}$. @ $V_{DD}=15V$ $I_T=(2.25\mu A/kHz)f+I_{DD}$

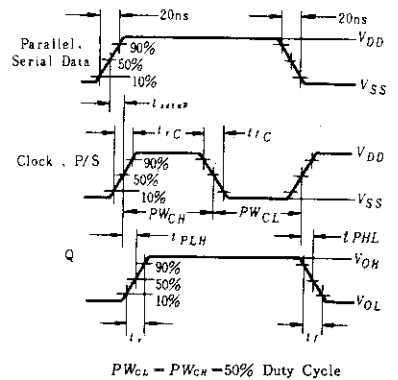
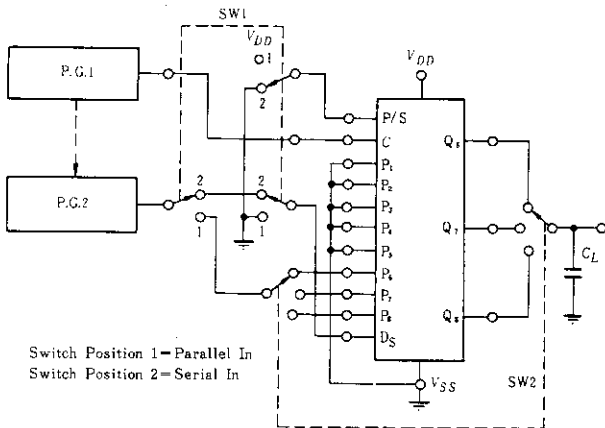
POWER DISSIPATION TEST CIRCUIT AND WAVEFORM

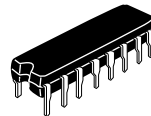


■ SWITCHING CHARACTERISTICS ($C_L=50\text{pF}$, $T_a=25^\circ\text{C}$)

Characteristic	Symbol	V_{DD} (V)	min	typ	max	Unit
Output Rise Time	t_r	5.0	—	180	400	ns
		10	—	90	200	
		15	—	65	160	
Output Fall Time	t_f	5.0	—	100	200	ns
		10	—	50	100	
		15	—	37	80	
Propagation Delay Time	t_{PLH} , t_{PHL}	5.0	—	400	1000	ns
		10	—	170	400	
		15	—	115	265	
Clock Pulse Width	PW_C	5.0	500	150	—	ns
		10	200	75	—	
		15	150	40	—	
Clock Frequency	f_c	5.0	—	3.0	1.0	MHz
		10	—	6.0	2.5	
		15	—	8.0	3.0	
Parallel/Serial Control Pulse Width	PW(P/S)	5.0	500	150	—	ns
		10	200	75	—	
		15	150	40	—	
Setup Time	t_{setup}	5.0	500	150	—	ns
		10	100	50	—	
		15	80	30	—	
Input Clock Rise Time	t_{rc}	5.0	—	—	15	μs
		10	—	—	15	
		15	—	—	15	

■ SWITCHING TIME TEST CIRCUIT





Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g

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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose, CA 95134
Tel: <1> (408) 433-1990
Fax: <1> (408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher Straße 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building, No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX

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