

HD74LS165A

Parallel-Load 8-bit Shift Register

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The LS165A are 8-bit serial shift registers that shift the data in the direction of Q_A toward Q_H when clocked. Parallel-in access to each stage is made available by eight individual direct data inputs that are enabled by a low level at the shift / load input. These registers also feature gated clock inputs and complementary outputs from the eighth bit. All inputs are diode-clamped to minimize transmission-line effects, thereby simplifying system design.

Clocking is accomplished through a 2-input positive-NOR gate, permitting one input to be used as a clock-inhibit function. Holding either of the clock inputs high inhibits clocking and holding either clock input low with the shift / load input high enables the other clock input. The clock-inhibit input should be changed to the high level only while the clock input is high. Parallel loading is inhibited as long as the shift / load input is high. Data at the parallel inputs are loaded directly into the register on a high-to-low transition of the shift / load input independently of the levels of the clock, clock inhibit, or serial inputs.

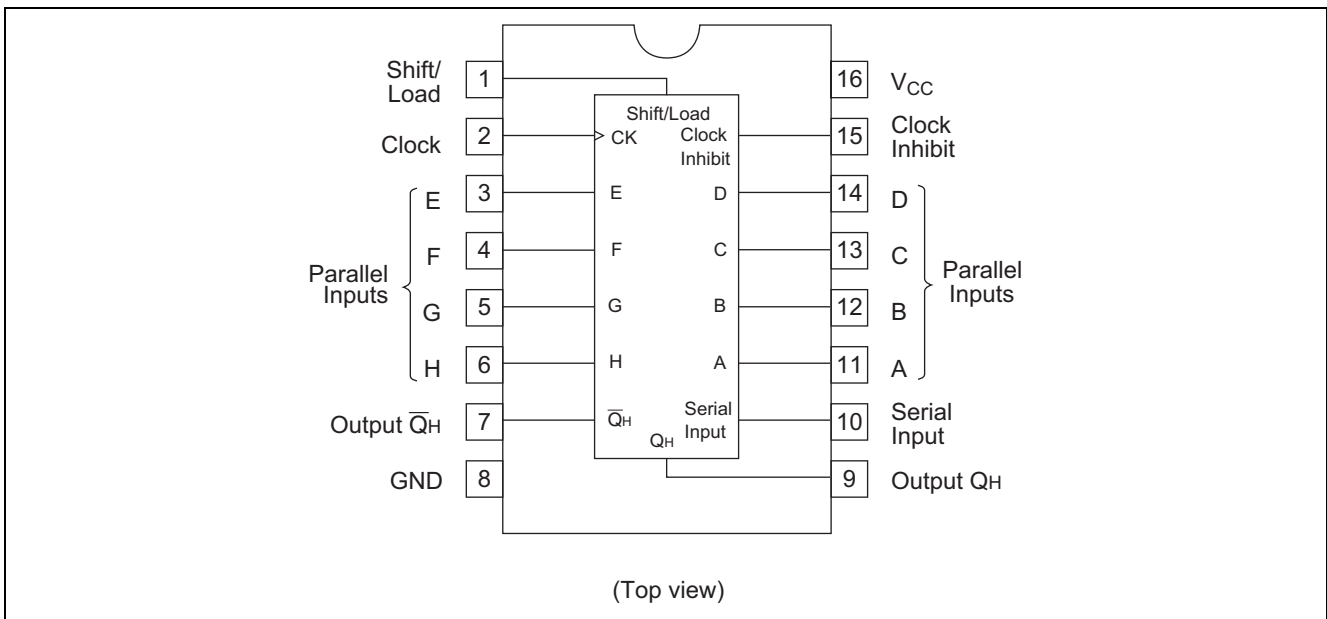
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS165AP	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS165AFPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

Pin Arrangement

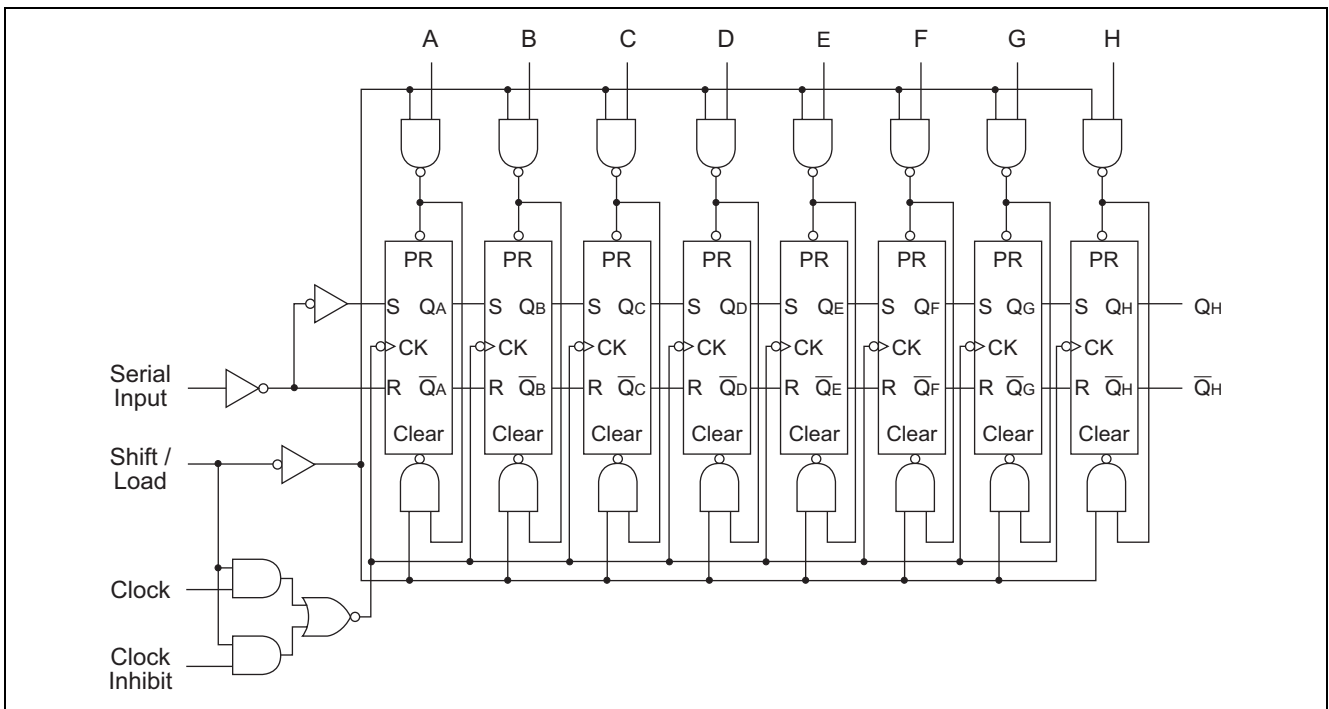


[Function Table](#) ["HD74LS165A"供应商](#)

Shift / Load	Clock Inhibit	Inputs			Internal outputs		Output Q _H
		Clock	Serial	Parallel A...H	Q _A	Q _B	
L	X	X	X	a...h	a	b	h
H	L	↑	X	X	Q _{A0}	Q _{B0}	Q _{H0}
H	L	↑	H	X	H	Q _{An}	Q _{Gn}
H	L	↑	L	X	L	Q _{An}	Q _{Gn}
H	H	X	X	X	Q _{A0}	Q _{B0}	Q _{H0}

- Notes:
1. H; high level, L; low level, X; irrelevant
 2. ↑; transition from low to high level
 3. a to h; the level of steady-state input at inputs A to H respectively
 4. Q_{A0} to Q_{H0}; the level of Q_A to Q_H, respectively, before the indicated steady-state input conditions were established.
 5. Q_{An} to Q_{Gn}; the level of Q_A to Q_G, respectively, before the most recent ↓ transition of the clock.

Block Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V _{CC}	7	V
Input voltage	V _{IN}	7	V
Power dissipation	P _T	400	mW
Storage temperature	T _{stg}	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.75	5.00	5.25	V
Output current	I_{OH}	—	—	-400	μA
	I_{OL}	—	—	8	mA
Operating temperature	T_{opr}	-20	25	75	$^{\circ}C$
Clock frequency	f_{clock}	0	—	25	MHz
Clock pulse width	$t_w (clock)$	25	—	—	ns
Load pulse width	$t_w (load)$	15	—	—	ns
Clock enable setup time	t_{su}	30	—	—	ns
Parallel input setup time	t_{su}	10	—	—	ns
Serial input setup time	t_{su}	20	—	—	ns
Shift setup time	t_{su}	45	—	—	ns
Hold time	t_h	0	—	—	ns

Electrical Characteristics

($T_a = -20$ to $+75^{\circ}C$)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	V_{IH}	2.0	—	—	V	
	V_{IL}	—	—	0.8	V	
Output voltage	V_{OH}	2.7	—	—	V	$V_{CC} = 4.75 V, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OH} = -400 \mu A$
	V_{OL}	—	—	0.4	V	$I_{OL} = 4 mA$
Input current	Shift / Load	—	—	0.3	mA	$V_{CC} = 5.25 V, V_I = 7 V$
	Other inputs	—	—	0.1	mA	
High level input current	Shift / Load	—	—	60	μA	$V_{CC} = 5.25 V, V_I = 2.7 V$
	Other inputs	—	—	20	μA	
Low level input current	Shift / Load	—	—	-1.2	mA	$V_{CC} = 5.25 V, V_I = 0.4 V$
	Other inputs	—	—	-0.4	mA	
Short-circuit output current	I_{OS}	-20	—	-100	mA	$V_{CC} = 5.25 V$
Supply current**	I_{CC}	—	21	36	mA	$V_{CC} = 5.25 V$
Input clamp voltage	V_{IK}	—	—	-1.5	V	$V_{CC} = 4.75 V, I_{IN} = -18 mA$

Note: * $V_{CC} = 5 V, T_a = 25^{\circ}C$

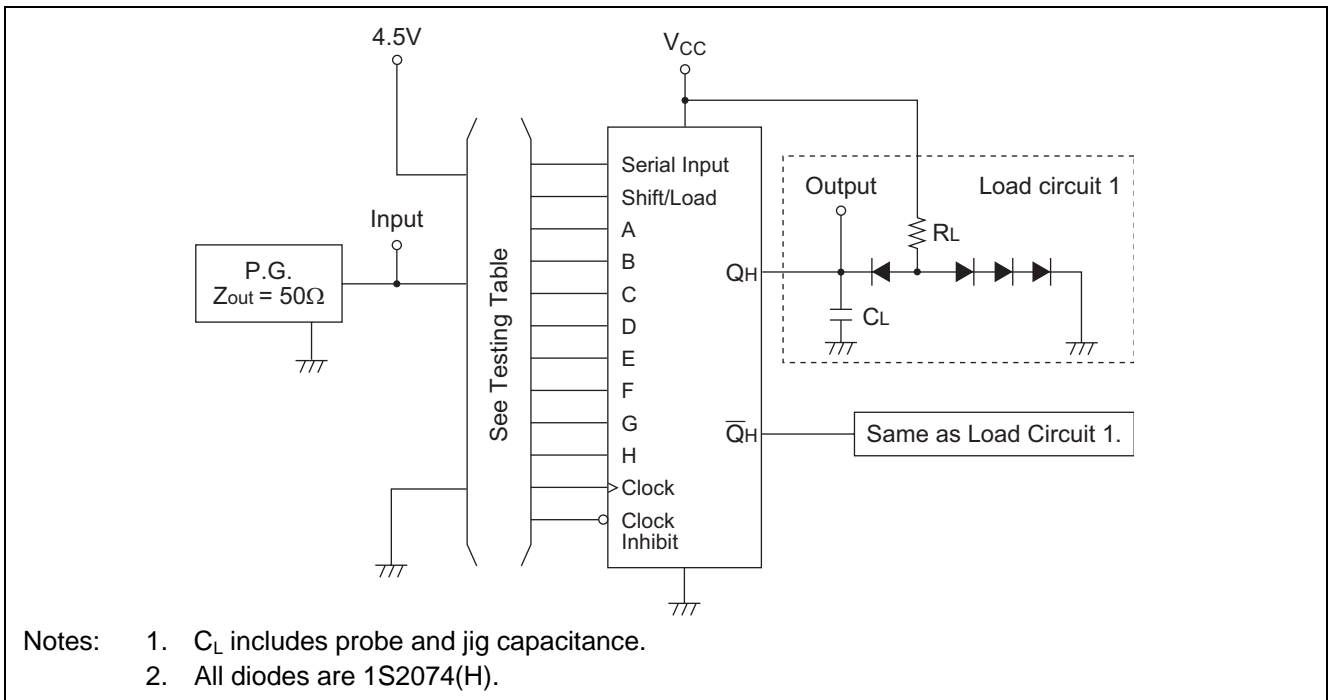
** With the outputs open, clock inhibit and clock at 4.5 V, and a clock pulse applied to the shift / load, I_{CC} is measured with the parallel inputs at 4.5 V, than with the parallel inputs grounded.

Switching Characteristics

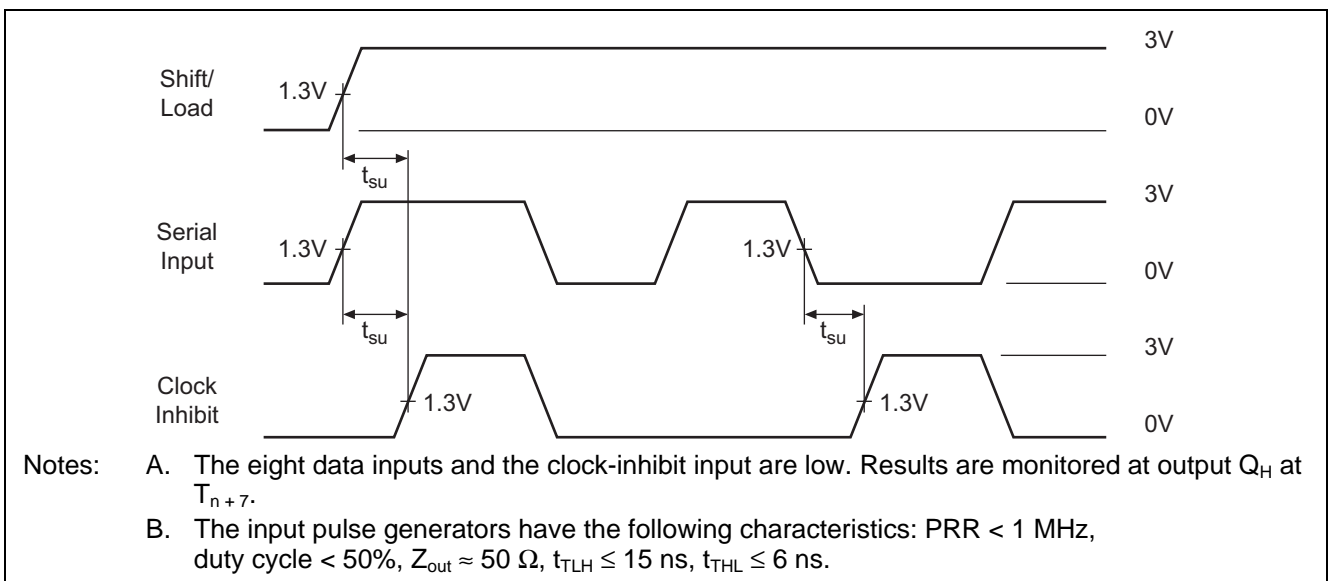
($V_{CC} = 5 V, T_a = 25^{\circ}C$)

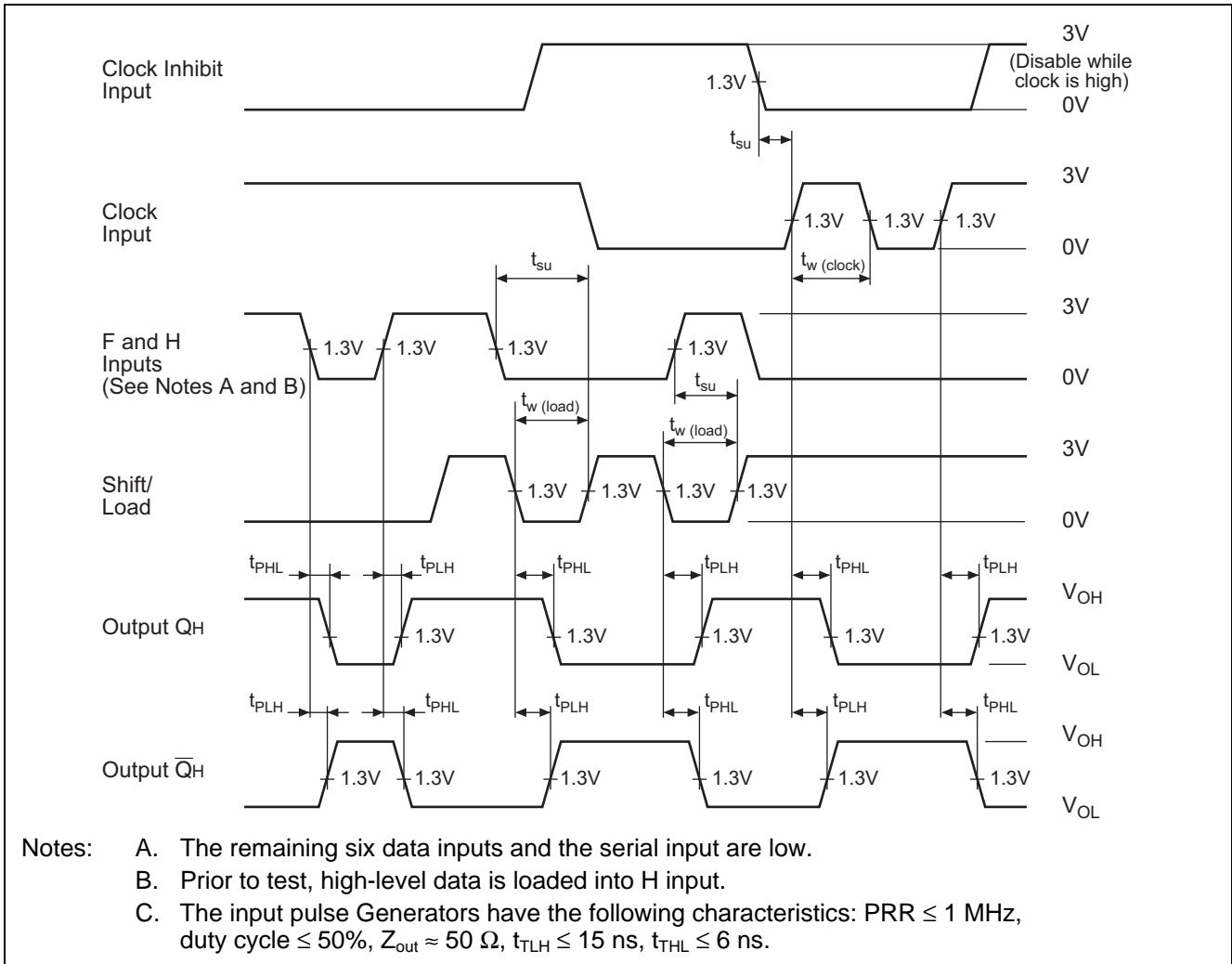
Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Maximum clock frequency	f_{max}			25	35	—	MHz	$C_L = 15 pF, R_L = 2 k\Omega$
Propagation delay time	t_{PLH}	Load	Any	—	21	35	ns	
	t_{PHL}			—	26	35	ns	
	t_{PLH}	Clock	Any	—	14	25	ns	
	t_{PHL}			—	16	25	ns	
	t_{PLH}	H	Q_H	—	13	25	ns	
	t_{PHL}			—	24	30	ns	
	t_{PLH}	H	Q_H	—	19	30	ns	
	t_{PHL}			—	17	25	ns	

Test Circuit

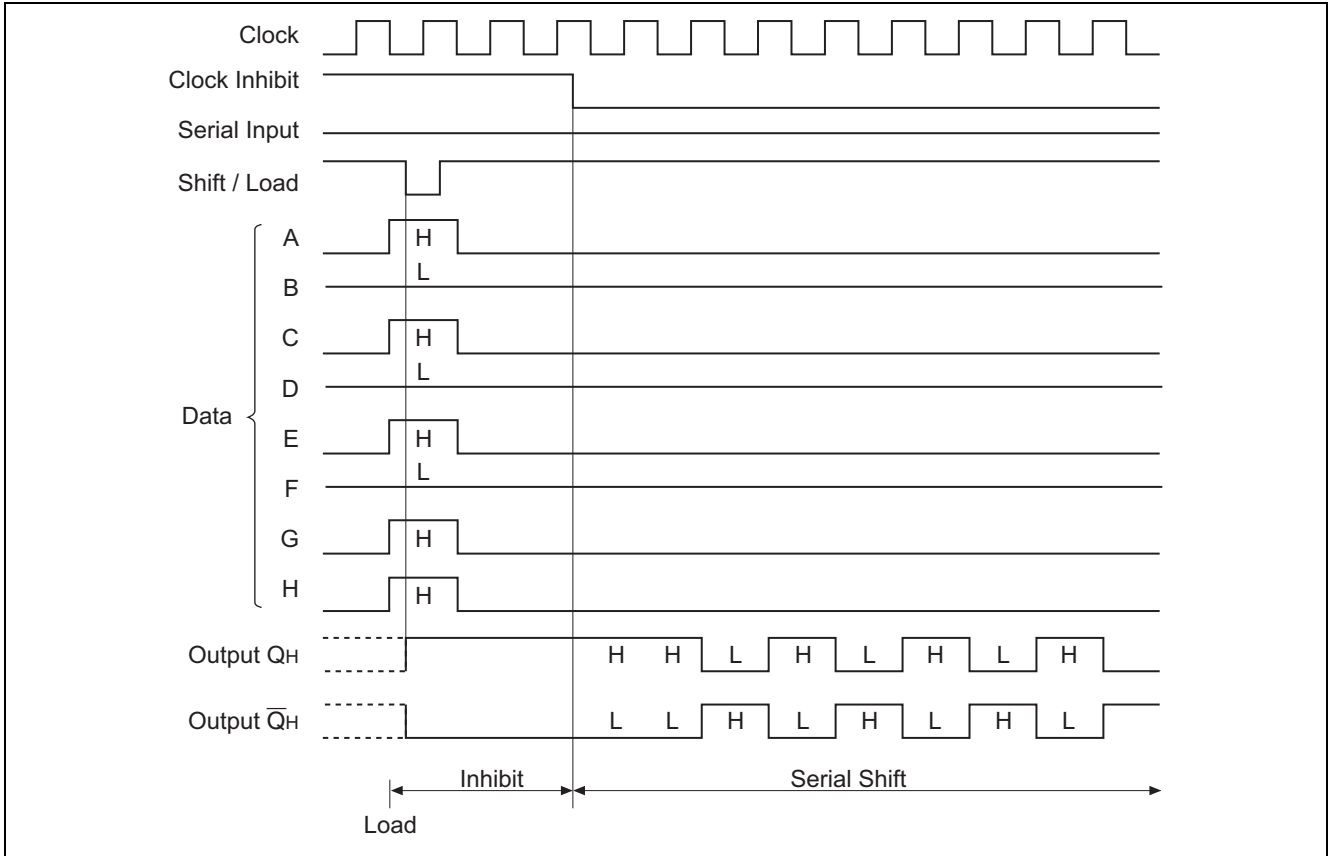


Waveforms 1

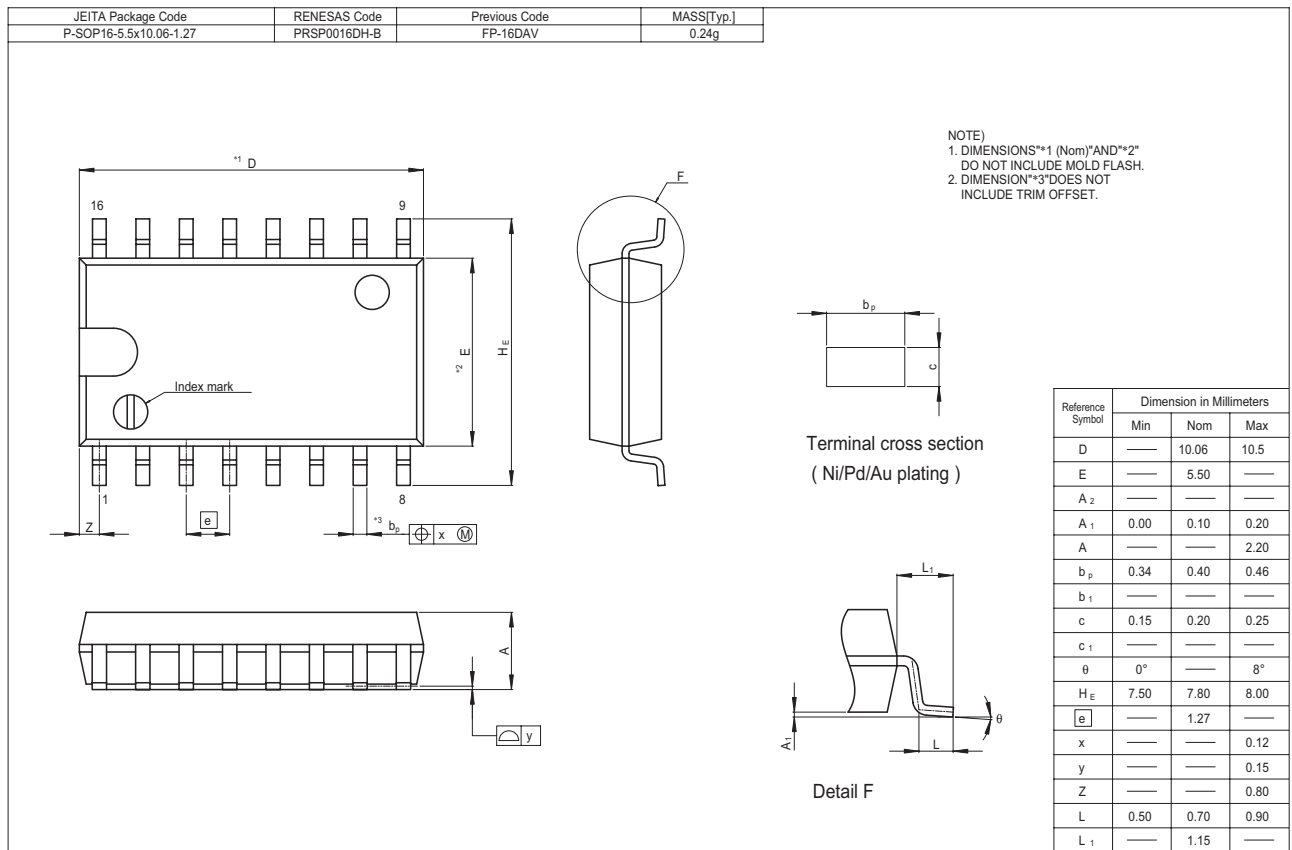
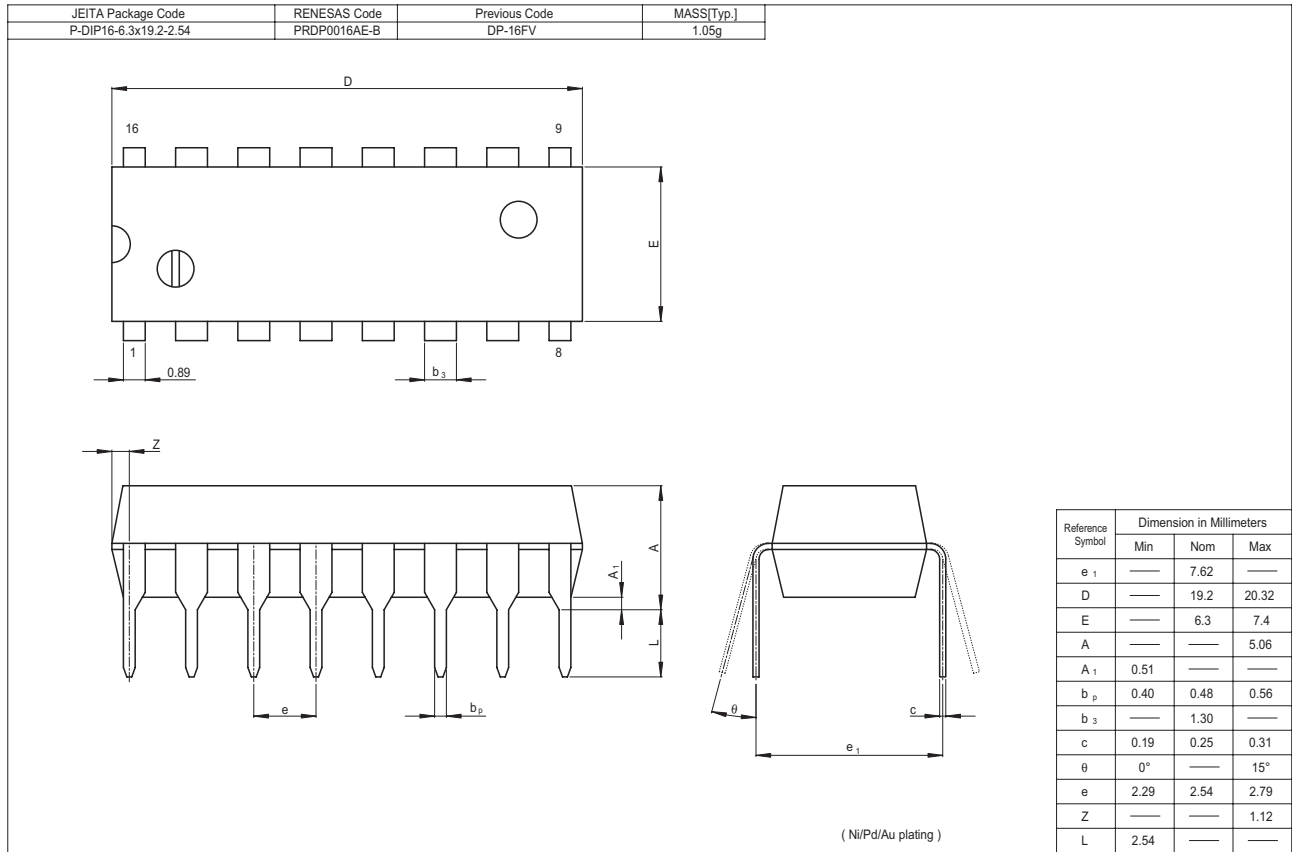




Typical Shift, Load and Inhibit Sequences



Package Dimensions 封装尺寸



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450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology Hong Kong Ltd.

7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.

10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.

Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.

1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.

Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> 2-796-3115, Fax: <82> 2-796-2145

Renesas Technology Malaysia Sdn. Bhd.

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510