

# HD74LS166A ●8-bit Shift Registers

The inputs are buffered to lower the drive requirements to one series 74 or 74LS standard load, respectively. Input clamping diodes minimize switching transients and simplify system design. This parallel-in or serial-in, serial-out shift register has a complexity of 77 equivalent gates on a monolithic chip. This device features gated clock inputs and an overriding clear input.

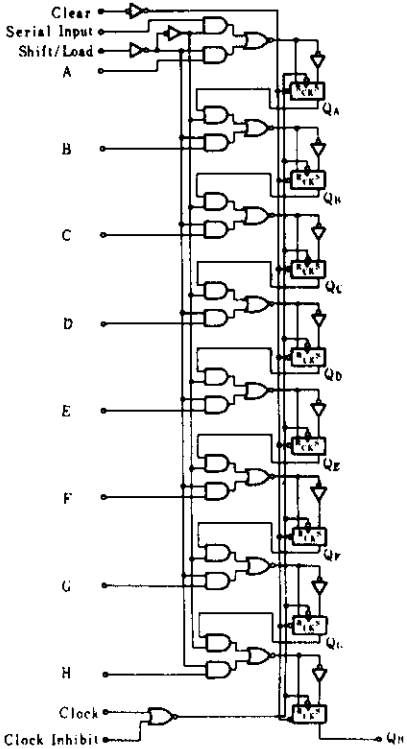
The parallel-in or serial-in modes are established by the shift/load input.

When high, this input enables the serial data input and couples the eight flip-flops for serial shifting with each clock pulse. When low, the parallel (broadside) data inputs are enabled and synchronous loading occurs on the next clock pulse. During parallel loading, serial data flow is inhibited.

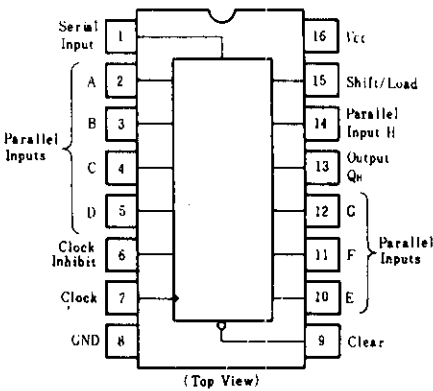
Clocking is accomplished on the low-to-high-level edge of the clock pulse through a two-input positive NOR gate permitting one input to be used as a clock-enable or clock-inhibit function. Holding either of the clock inputs high inhibits clocking; holding either low enables the other clock input.

This, of course, allows the system clock to be free-running and the register can be stopped on command with the other clock input. The clock-inhibit input should be changed to the high level only while the clock input is high. A buffered, direct clear input overrides all other inputs, including the clock, and sets all flip-flops to zero.

## ■ BLOCK DIAGRAM



## ■ PIN ARRANGEMENT



## ■ FUNCTION TABLE

Inputs						Internal Outputs		Outputs
Clear	Shift Load	Clock Inhibit	Clock	Serial	Parallel A.....H	QA	QH	QH
L	X	X	X	X	X	L	L	L
H	X	L	L	X	X	QA(i)	QH(i)	QH(i)
H	L	L	↑	X	a.....h	a	b	h
H	H	L	↑	H	X	H	QA,n	QH,n
H	H	L	↑	L	X	L	QA,n	QH,n
H	X	H	↑	X	X	QA(i)	QH(i)	QH(i)

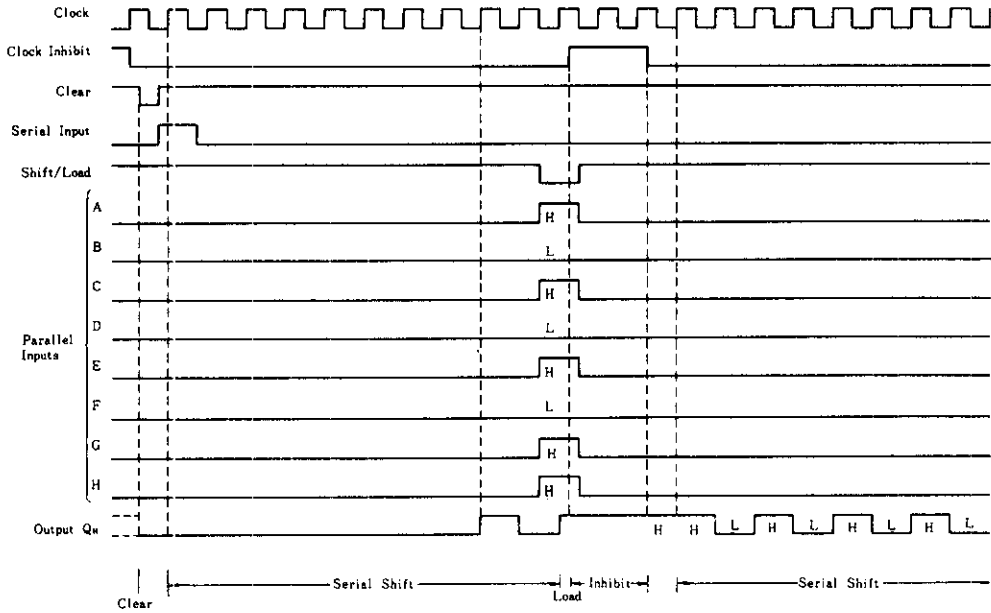
- Notes) 1. H; high level, L; low level, X; irrelevant  
2. ↑; transition from low to high level  
3. ↓; transition from high to low level  
4. a~h; the level of steady-state input at inputs A to H respectively  
5. QA0~QH0; the level of QA to QH, respectively, before the indicated steady-state input conditions were established.  
6. QA,n~QH,n; the level of QA to QH, respectively, before the most recent ↓ transition of the clock.

## ■ RECOMMENDED OPERATING CONDITIONS

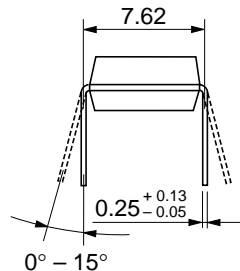
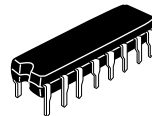
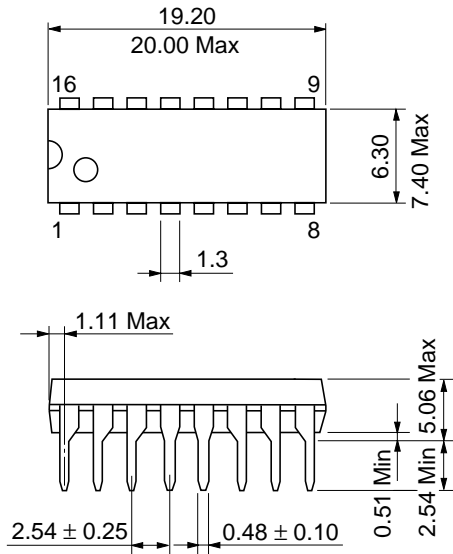
Item	Symbol	min	nom	max	Unit
High level output current	IOH	—	—	—400	μA
Low level output current	IOL	—	—	8	mA
Clock frequency	fclock	0	—	25	MHz
Clock and clear pulse width	tW	20	—	—	ns
Mode control setup time	tSu	30	—	—	ns
Data setup time	tSu	20	—	—	ns
Hold time	tH	0	—	—	ns



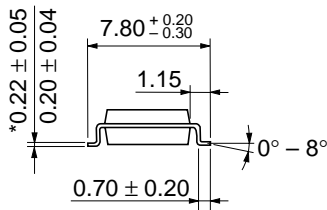
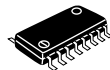
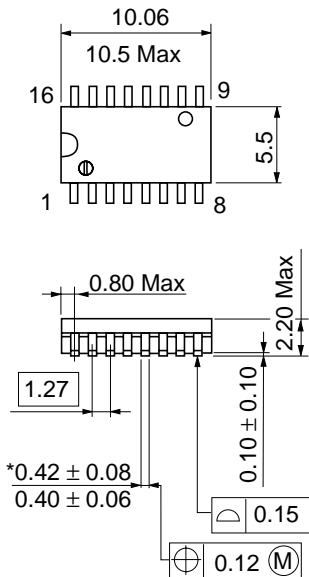
## ■ TYPICAL CLEAR, SHIFT, LOAD, INHIBIT, AND SHIFT SEQUENCES



Unit: mm

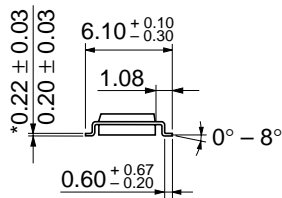
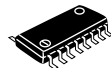
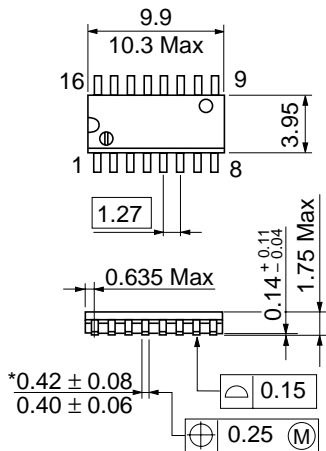


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g



\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

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