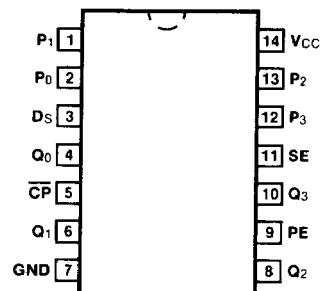


✓ 54/74178 010680

## 4-BIT SHIFT REGISTER

### CONNECTION DIAGRAM PINOUT A

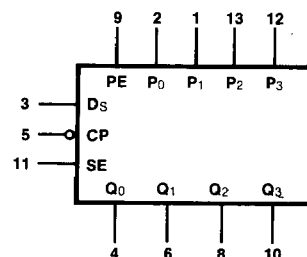


**DESCRIPTION** — The '178 features synchronous parallel or serial entry and parallel outputs. The flip-flops are fully edge-triggered, with state changes initiated by a HIGH-to-LOW transition of the clock. Parallel Enable and Serial Enable inputs are used to select Load, Shift and Hold modes of operation. The '178 is the 14-pin version of the '179. For detail specifications, please refer to the '179 data sheet.

**ORDERING CODE:** See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE	MILITARY GRADE	PKG TYPE
		V <sub>CC</sub> = +5.0 V ±5%, T <sub>A</sub> = 0°C to +70°C	V <sub>CC</sub> = +5.0 V ±10%, T <sub>A</sub> = -55°C to +125°C	
Plastic DIP (P)	A	74178PC		9A
Ceramic DIP (D)	A	74178DC	54178DM	6A
Flatpak (F)	A	74178FC	54178FM	3I

### LOGIC SYMBOL





V<sub>CC</sub> = Pin 14  
GND = Pin 7

**INPUT LOADING/FAN-OUT:** See Section 3 for U.L. definitions

PIN NAMES	DESCRIPTION	54/74 (U.L.) HIGH/LOW
PE	Parallel Enable Input	1.0/1.0
P <sub>0</sub> — P <sub>3</sub>	Parallel Data Inputs	1.0/1.0
D <sub>S</sub>	Serial Data Input	1.0/1.0
SE	Shift Enable Input	1.0/1.0
CP	Clock Pulse Input (Active Falling Edge)	1.0/1.0
Q <sub>0</sub> — Q <sub>3</sub>	Flip-flop Outputs	20/10

**FUNCTIONAL DESCRIPTION** — The '178 contains four D-type edge-triggered flip-flops and sufficient inter-stage logic to perform parallel load, shift right or hold operations. All state changes are initiated by a HIGH-to-LOW transition of the clock. A HIGH signal on the Shift Enable (SE) input prevents parallel loading and permits a right shift each time the clock makes a negative transition. When the SE input is LOW, the signal applied to the Parallel Enable (PE) input determines whether the circuit is in a parallel load or a hold mode, as shown in the Mode Select Table. The SE, PE,  $D_S$  and  $P_n$  inputs can change when the clock is in either state, provided only that the recommended setup and hold times are observed.

**MODE SELECT TABLE**

INPUTS			RESPONSE
SE	PE	$\overline{CP}$	
H	X		Right Shift. $D_S \rightarrow Q_0$ ; $Q_0 \rightarrow Q_1$ , etc.
L	H		Parallel load $P_n \rightarrow Q_n$ .
L	L	X	Hold

H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial.

**LOGIC DIAGRAM**

