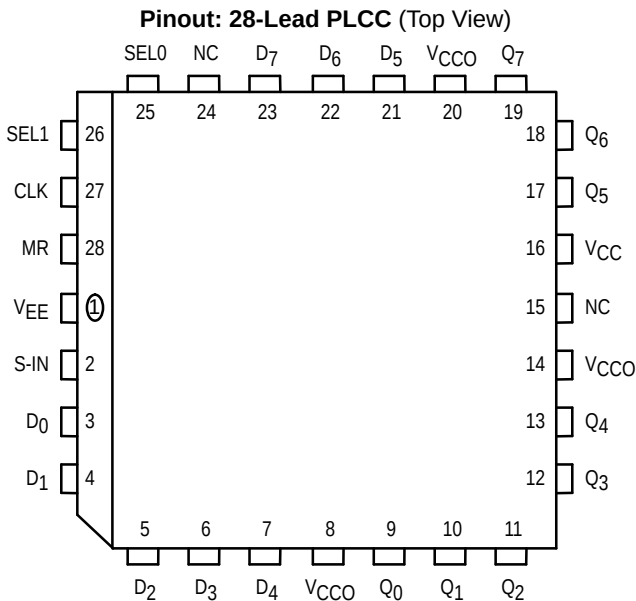


# 8-Bit Scannable Register

The MC10E/100E241 is an 8-bit shiftable register. Unlike a standard universal shift register such as the E141, the E241 features internal data feedback organized so that the SHIFT control overrides the HOLD/LOAD control. This enables the normal operations of HOLD and LOAD to be toggled with a single control line without the need for external gating. It also enables switching to scan mode with the single SHIFT control line.

The eight inputs D<sub>0</sub> – D<sub>7</sub> accept parallel input data, while S-IN accepts serial input data when in shift mode. Data is accepted a set-up time before the positive-going edge of CLK; shifting is also accomplished on the positive clock edge. A HIGH on the Master Reset pin (MR) asynchronously resets all the registers to zero.

- SHIFT overrides HOLD/LOAD Control
- 1000ps Max. CLK to Q
- Asynchronous Master Reset
- Pin-Compatible with E141
- Extended 100E V<sub>EE</sub> Range of – 4.2V to – 5.46V
- 75kΩ Input Pulldown Resistors



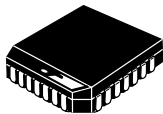
\* All V<sub>CC</sub> and V<sub>CCO</sub> pins are tied together on the die.

## PIN NAMES

| Pin                             | Function             |
|---------------------------------|----------------------|
| D <sub>0</sub> – D <sub>7</sub> | Parallel Date Inputs |
| S-IN                            | Serial Data Inputs   |
| SEL0                            | SHIFT Control        |
| SEL1                            | HOLD/LOAD Control    |
| CLK                             | Clock                |
| MR                              | Master Reset         |
| Q <sub>0</sub> – Q <sub>7</sub> | Data Outputs         |

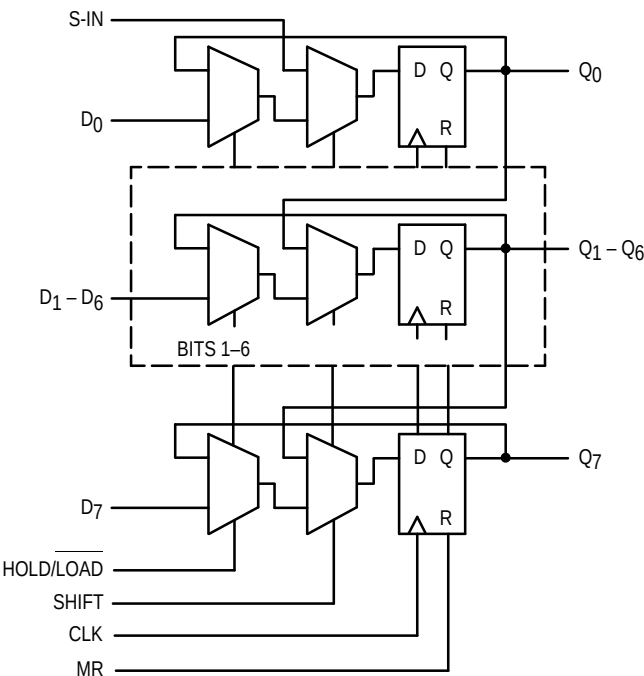
**MC10E241**  
**MC100E241**

**8-BIT SCANNABLE  
REGISTER**



**FN SUFFIX**  
PLASTIC PACKAGE  
CASE 776-02

## LOGIC DIAGRAM



**DC CHARACTERISTICS** ( $V_{EE} = V_{EE(min)}$  to  $V_{EE(max)}$ ;  $V_{CC} = V_{CCO} = GND$ )

| Symbol   | Characteristic       | 0°C |     |     | 25°C |     |     | 85°C |     |     | Unit    | Condition |
|----------|----------------------|-----|-----|-----|------|-----|-----|------|-----|-----|---------|-----------|
|          |                      | min | typ | max | min  | typ | max | min  | typ | max |         |           |
| $I_{IH}$ | Input HIGH Current   |     |     | 150 |      |     | 150 |      |     | 150 | $\mu A$ |           |
| $I_{EE}$ | Power Supply Current |     |     |     |      |     |     |      |     |     | MA      |           |
|          | 10E                  |     | 125 | 150 |      | 125 | 150 |      | 125 | 150 |         |           |
|          | 100E                 |     | 125 | 150 |      | 125 | 150 |      | 144 | 173 |         |           |

**AC CHARACTERISTICS** ( $V_{EE} = V_{EE(min)}$  to  $V_{EE(max)}$ ;  $V_{CC} = V_{CCO} = GND$ )

| Symbol                 | Characteristic                                                  | 0°C                      |                               |            | 25°C                     |                               |            | 85°C                     |                               |            | Unit | Condition |
|------------------------|-----------------------------------------------------------------|--------------------------|-------------------------------|------------|--------------------------|-------------------------------|------------|--------------------------|-------------------------------|------------|------|-----------|
|                        |                                                                 | min                      | typ                           | max        | min                      | typ                           | max        | min                      | typ                           | max        |      |           |
| $f_{SHIFT}$            | Max. Shift Frequency                                            | 700                      | 900                           |            | 700                      | 900                           |            | 700                      | 900                           |            | MHz  |           |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay to Output<br>Clk<br>MR                        | 625<br>600               | 750<br>725                    | 975<br>975 | 625<br>600               | 750<br>725                    | 975<br>975 | 625<br>600               | 750<br>725                    | 975<br>975 | ps   |           |
| $t_s$                  | Setup Time<br>D<br>SEL0 (SHIFT)____<br>SEL1 (HOLD/LOAD)<br>S-IN | 175<br>350<br>400<br>125 | 25<br>200<br>250<br>-100      |            | 175<br>350<br>400<br>125 | 25<br>200<br>250<br>-100      |            | 175<br>350<br>400<br>125 | 25<br>200<br>250<br>-100      |            | ps   |           |
| $t_h$                  | Hold Time<br>D<br>SEL0 (SHIFT)____<br>SEL1 (HOLD/LOAD)<br>S-IN  | 200<br>100<br>50<br>300  | - 25<br>- 200<br>- 250<br>100 |            | 200<br>100<br>50<br>300  | - 25<br>- 200<br>- 250<br>100 |            | 200<br>100<br>50<br>300  | - 25<br>- 200<br>- 250<br>100 |            | ps   |           |
| $t_{RR}$               | Reset Recovery Time                                             | 900                      | 600                           |            | 900                      | 600                           |            | 900                      | 600                           |            | ps   |           |
| $t_{PW}$               | Minimum Pulse Width<br>Clk, MR                                  | 400                      |                               |            | 400                      |                               |            | 400                      |                               |            | ps   |           |
| $t_{SKEW}$             | Within-Device Skew                                              |                          | 60                            |            |                          | 60                            |            |                          | 60                            |            | ps   | 1         |
| $t_r$<br>$t_f$         | Rise/Fall Times<br>20 - 80%                                     | 300                      | 525                           | 800        | 300                      | 525                           | 800        | 300                      | 525                           | 800        | ps   |           |

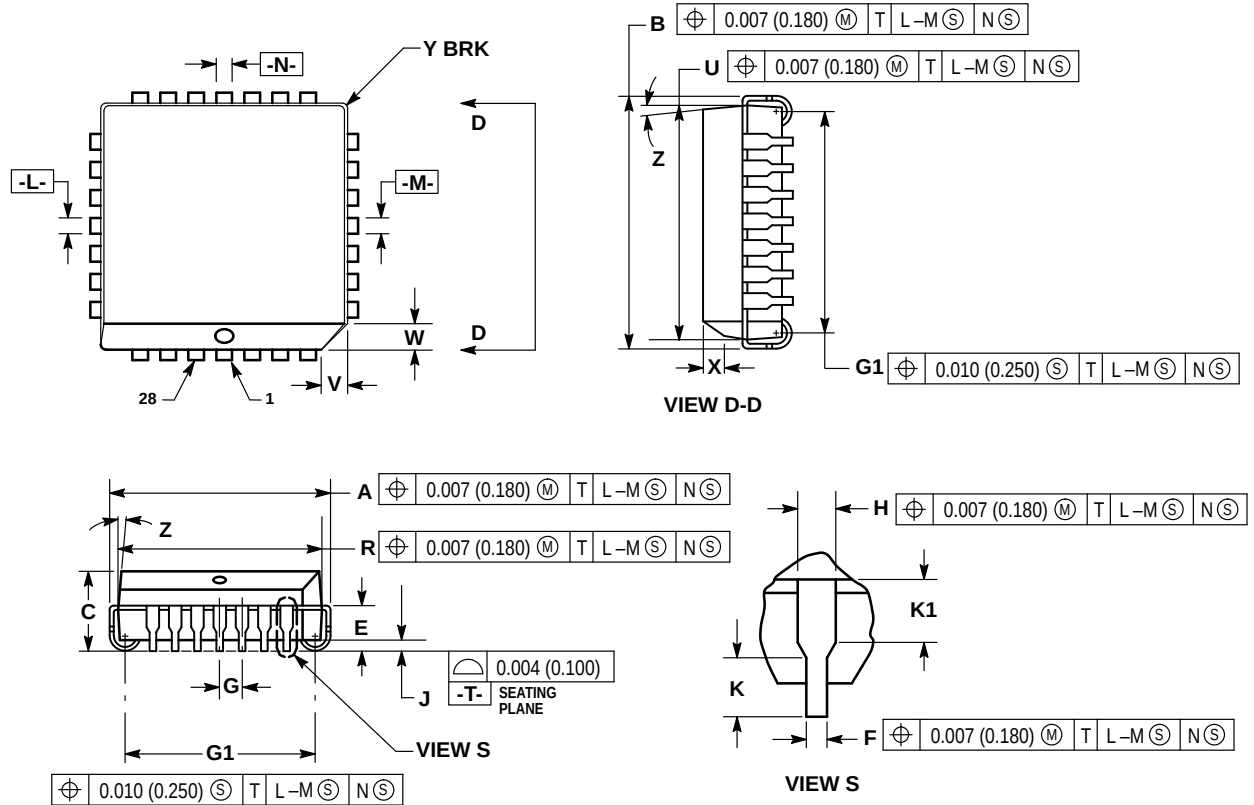
1. Within-device skew is defined as identical transitions on similar paths through a device.

**FUNCTION TABLE**

| MR | SEL0 | SEL1 | Function    |
|----|------|------|-------------|
| 1  | X    | X    | Outputs LOW |
| 0  | 1    | X    | Shift Data  |
| 0  | 0    | 1    | Hold Data   |
| 0  | 0    | 0    | Load Data   |

## OUTLINE DIMENSIONS

FN SUFFIX  
PLASTIC PLCC PACKAGE  
CASE 776-02  
ISSUE D



## NOTES:

- DATUMS -L-, -M-, AND -N- DETERMINED WHERE TOP OF LEAD SHOULDER EXITS PLASTIC BODY AT MOLD PARTING LINE.
- DIM G1, TRUE POSITION TO BE MEASURED AT DATUM -T-, SEATING PLANE.
- DIM R AND U DO NOT INCLUDE MOLD FLASH. ALLOWABLE MOLD FLASH IS 0.010 (0.250) PER SIDE.
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
- THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM BY UP TO 0.012 (0.300). DIMENSIONS R AND U ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.
- DIMENSION H DOES NOT INCLUDE DAMBAR PROTRUSION OR INTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE GREATER THAN 0.037 (0.940). THE DAMBAR INTRUSION(S) SHALL NOT CAUSE THE H DIMENSION TO BE SMALLER THAN 0.025 (0.635).

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.485     | 0.495 | 12.32       | 12.57 |
| B   | 0.485     | 0.495 | 12.32       | 12.57 |
| C   | 0.165     | 0.180 | 4.20        | 4.57  |
| E   | 0.090     | 0.110 | 2.29        | 2.79  |
| F   | 0.013     | 0.019 | 0.33        | 0.48  |
| G   | 0.050 BSC |       | 1.27 BSC    |       |
| H   | 0.026     | 0.032 | 0.66        | 0.81  |
| J   | 0.020     | —     | 0.51        | —     |
| K   | 0.025     | —     | 0.64        | —     |
| R   | 0.450     | 0.456 | 11.43       | 11.58 |
| U   | 0.450     | 0.456 | 11.43       | 11.58 |
| V   | 0.042     | 0.048 | 1.07        | 1.21  |
| W   | 0.042     | 0.048 | 1.07        | 1.21  |
| X   | 0.042     | 0.056 | 1.07        | 1.42  |
| Y   | —         | 0.020 | —           | 0.50  |
| Z   | 2°        | 10°   | 2°          | 10°   |
| G1  | 0.410     | 0.430 | 10.42       | 10.92 |
| K1  | 0.040     | —     | 1.02        | —     |

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