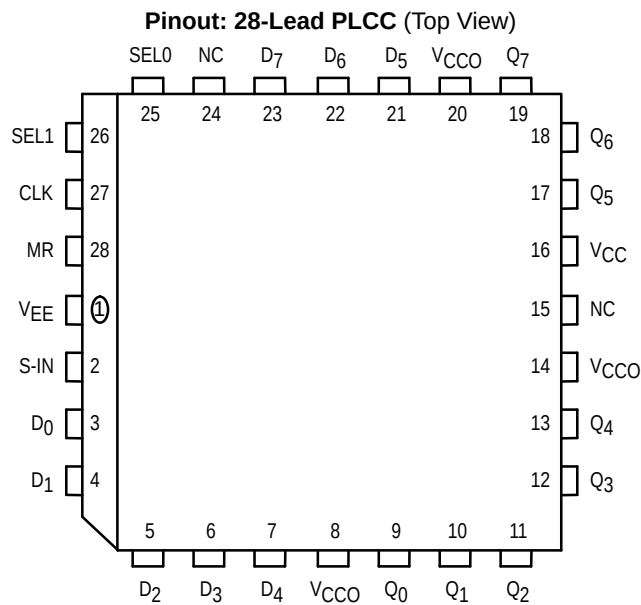


# 8-Bit Scannable Register

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



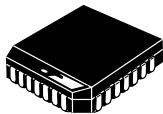
\* All V<sub>CC</sub> and V<sub>CCO</sub> pins are tied together on the die.

## 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         |

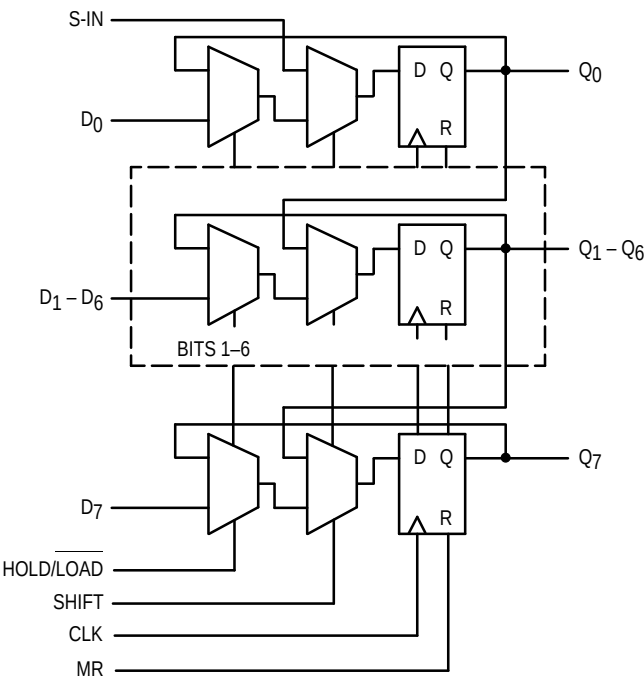
**MC10E241**  
**MC100E241**

**8-BIT SCANNABLE  
REGISTER**



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

## LOGIC DIAGRAM



# MC10E241 MC100E241

## 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   |           |

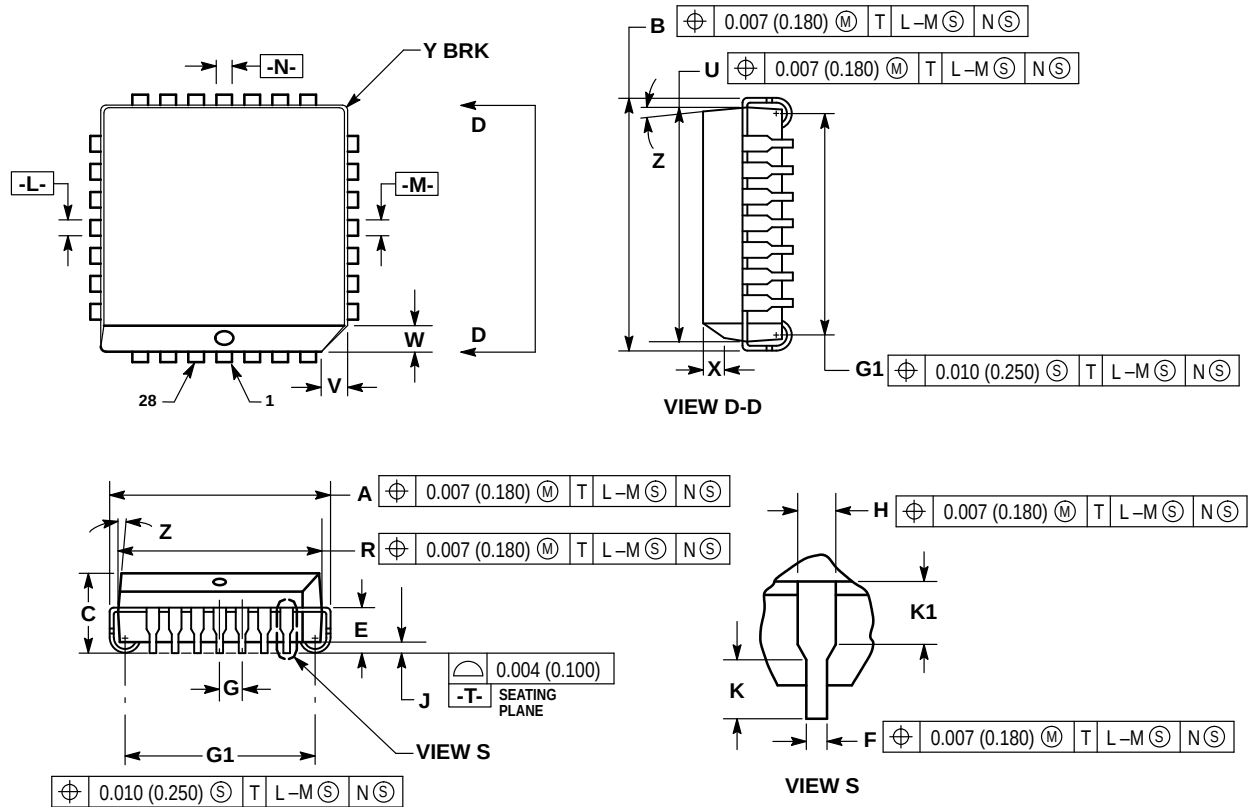
1. Within-device skew is defined as identical transitions on similar paths through a device.

## 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        | —     |

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447 or 602-303-5454

**MFAX:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
**INTERNET:** <http://Design-NET.com>

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,  
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-81-3521-8315

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

