

## FEATURES

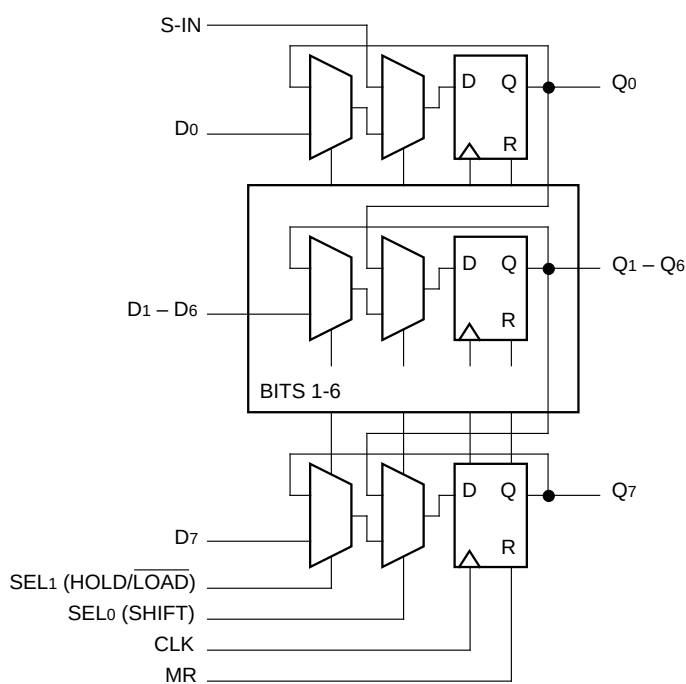
- 1000ps max. CLK to output
- Extended 100E VEE range of -4.2V to -5.5V
- SHIFT overrides HOLD, /LOAD control
- Asynchronous Master Reset
- Pin-compatible with E141
- Fully compatible with industry standard 10KH, 100K ECL levels
- Internal 75KΩ input pulldown resistors
- Fully compatible with Motorola MC10E/100E241
- Available in 28-pin PLCC package

## DESCRIPTION

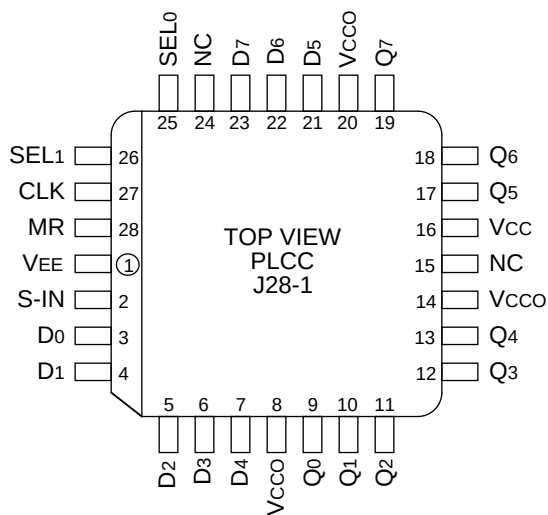
The SY10/100E241 are 8-bit shiftable registers designed for use in new, high-performance ECL systems. Unlike the E141, the E241 features internal data feedback organized such that the SHIFT control overrides the HOLD, /LOAD control. Thus, the normal operations of HOLD and LOAD can be toggled with a single control line without the need for external gating. This configuration also enables switching to scan mode with the single SHIFT control line.

The eight inputs D0–D7 accept parallel input data, while S-IN accepts serial input data when in shift mode. Data is accepted a set-up time before the rising edge of CLK. Shifting is also accomplished on the rising clock edge. A HIGH on the Master Reset pin (MR) asynchronously resets all the registers to zero.

## BLOCK DIAGRAM



## PIN CONFIGURATION



## PIN NAMES

| Pin   | Function             |
|-------|----------------------|
| D0–D7 | Parallel Data Inputs |
| S-IN  | Serial Data Input    |
| SEL0  | SHIFT Control        |
| SEL1  | HOLD, /LOAD Control  |
| CLK   | Clock                |
| MR    | Master Reset         |
| Q0–Q7 | Data Outputs         |
| Vcc0  | Vcc to Output        |

**TRUTH TABLE**

| SEL0 | SEL1 | Function                                    |
|------|------|---------------------------------------------|
| L    | L    | Load                                        |
| L    | H    | Hold                                        |
| H    | X    | Shift (D <sub>n</sub> to D <sub>n+1</sub> ) |

**DC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min.) to V<sub>EE</sub> (Max.); V<sub>CC</sub> = V<sub>CCO</sub> = GND

| Symbol          | Parameter            | T <sub>A</sub> = 0°C |      |      | T <sub>A</sub> = +25°C |      |      | T <sub>A</sub> = +85°C |      |      | Unit | Condition |
|-----------------|----------------------|----------------------|------|------|------------------------|------|------|------------------------|------|------|------|-----------|
|                 |                      | Min.                 | Typ. | Max. | Min.                   | Typ. | Max. | Min.                   | Typ. | Max. |      |           |
| I <sub>IH</sub> | Input HIGH Current   | —                    | —    | 150  | —                      | —    | 150  | —                      | —    | 150  | μA   | —         |
| I <sub>EE</sub> | Power Supply Current | —                    | —    | —    | —                      | —    | —    | —                      | —    | —    | mA   | —         |
|                 | 10E                  | —                    | 125  | 150  | —                      | 125  | 150  | —                      | 125  | 150  |      |           |
|                 | 100E                 | —                    | 125  | 150  | —                      | 125  | 150  | —                      | 144  | 173  |      |           |

**AC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min.) to V<sub>EE</sub> (Max.); V<sub>CC</sub> = V<sub>CCO</sub> = GND

| Symbol                               | Parameter                                | T <sub>A</sub> = 0°C |            |            | T <sub>A</sub> = +25°C |            |            | T <sub>A</sub> = +85°C |            |            | Unit | Condition |
|--------------------------------------|------------------------------------------|----------------------|------------|------------|------------------------|------------|------------|------------------------|------------|------------|------|-----------|
|                                      |                                          | Min.                 | Typ.       | Max.       | Min.                   | Typ.       | Max.       | Min.                   | Typ.       | Max.       |      |           |
| f <sub>SHIFT</sub>                   | Max. Shift Frequency                     | 700                  | 900        | —          | 700                    | 900        | —          | 700                    | 900        | —          | MHz  | —         |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | 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 <sub>s</sub>                       | Set-up Time                              | —                    | —          | —          | —                      | —          | —          | —                      | —          | —          | ps   | —         |
|                                      | D                                        | 175                  | 25         | —          | 175                    | 25         | —          | 175                    | 25         | —          |      |           |
|                                      | SEL <sub>0</sub> (SHIFT)350              | 200                  | —          | 350        | 200                    | —          | 350        | 200                    | —          | —          |      |           |
|                                      | SEL <sub>1</sub> (HOLD/LOAD)             | 400                  | 250        | —          | 400                    | 250        | —          | 400                    | 250        | —          |      |           |
| t <sub>H</sub>                       | S-IN                                     | 125                  | —100       | —          | 125                    | —100       | —          | 125                    | —100       | —          | ps   | —         |
|                                      | Hold Time                                | —                    | —          | —          | —                      | —          | —          | —                      | —          | —          |      |           |
|                                      | D                                        | 200                  | —25        | —          | 200                    | —25        | —          | 200                    | —25        | —          |      |           |
|                                      | SEL <sub>0</sub> (SHIFT)                 | 100                  | —200       | —          | 100                    | —200       | —          | 100                    | —200       | —          |      |           |
| t <sub>RR</sub>                      | SEL <sub>1</sub> (HOLD/LOAD)             | 50                   | —250       | —          | 50                     | —250       | —          | 50                     | —250       | —          | ps   | —         |
|                                      | S-IN                                     | 300                  | 100        | —          | 300                    | 100        | —          | 300                    | 100        | —          |      |           |
| t <sub>RR</sub>                      | Reset Recovery Time                      | 900                  | 600        | —          | 900                    | 600        | —          | 900                    | 600        | —          | ps   | —         |
| t <sub>PW</sub>                      | Minimum Pulse Width<br>CLK, MR           | 400                  | —          | —          | 400                    | —          | —          | 400                    | —          | —          | ps   | —         |
| t <sub>skew</sub>                    | Within-Device Skew                       | —                    | 60         | —          | —                      | 60         | —          | —                      | 60         | —          | ps   | 1         |
| t <sub>r</sub><br>t <sub>f</sub>     | Rise/Fall Time<br>20% to 80%             | 300                  | 525        | 800        | 300                    | 525        | 800        | 300                    | 525        | 800        | ps   | —         |

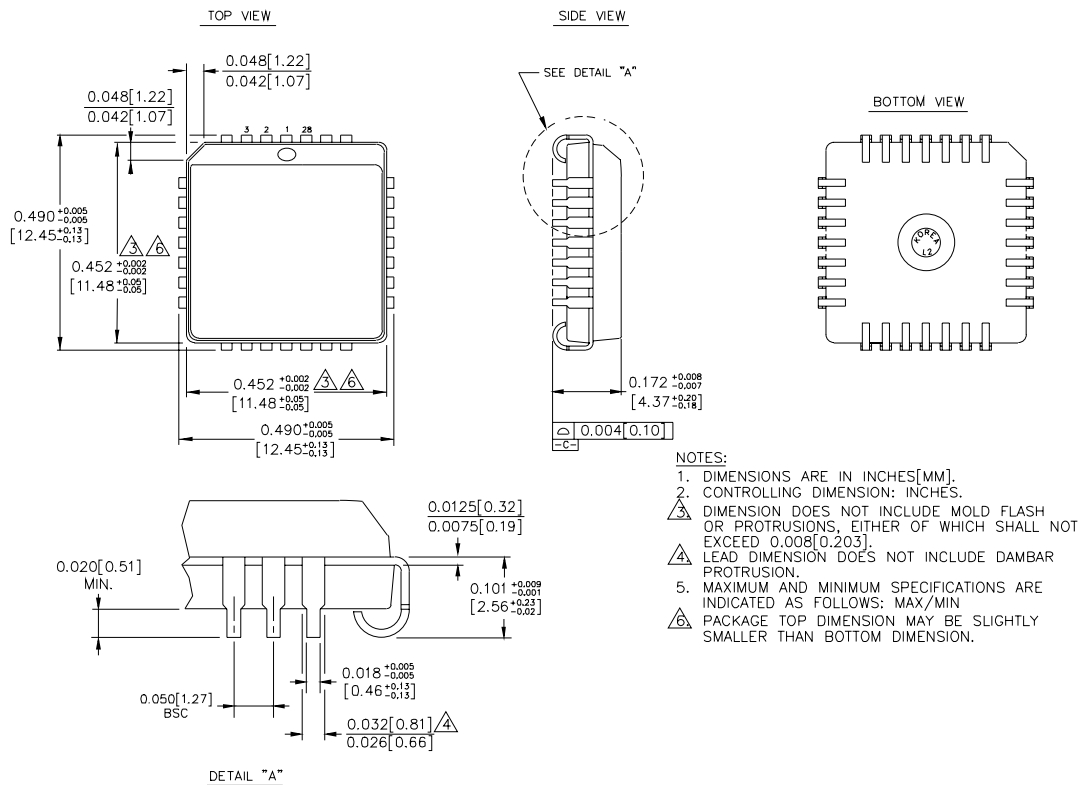
**NOTE:**

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

**PRODUCT ORDERING CODE**

| Ordering Code | Package Type | Operating Range |
|---------------|--------------|-----------------|
| SY10E241JC    | J28-1        | Commercial      |
| SY10E241JCTR  | J28-1        | Commercial      |
| SY100E241JC   | J28-1        | Commercial      |
| SY100E241JCTR | J28-1        | Commercial      |

## 28 LEAD PLCC (J28-1)



Rev. 03

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**MICREL-SYNERGY 3250 SCOTT BOULEVARD SANTA CLARA CA 95054 USA**

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