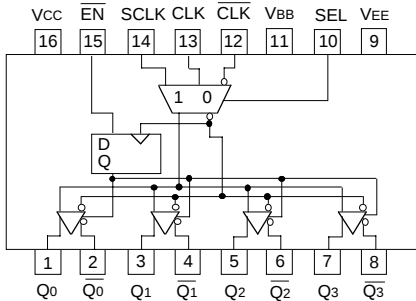


## PACKAGE/ORDERING INFORMATION



16-Pin Narrow SOIC (Z8-1)

Ordering Information<sup>(1)</sup>

| Part Number                     | Package Type | Operating Range | Package Marking                             | Lead Finish    |
|---------------------------------|--------------|-----------------|---------------------------------------------|----------------|
| SY10EL15ZC                      | Z16-2        | Commercial      | SY10EL15ZC                                  | Sn-Pb          |
| SY10EL15ZCTR <sup>(2)</sup>     | Z16-2        | Commercial      | SY10EL15ZC                                  | Sn-Pb          |
| SY100EL15ZC                     | Z16-2        | Commercial      | SY100EL15ZC                                 | Sn-Pb          |
| SY100EL15ZCTR <sup>(2)</sup>    | Z16-2        | Commercial      | SY100EL15ZC                                 | Sn-Pb          |
| SY10EL15ZI                      | Z16-2        | Industrial      | SY10EL15ZI                                  | Sn-Pb          |
| SY10EL15ZITR <sup>(2)</sup>     | Z16-2        | Industrial      | SY10EL15ZI                                  | Sn-Pb          |
| SY100EL15ZI                     | Z16-2        | Industrial      | SY100EL15ZI                                 | Sn-Pb          |
| SY100EL15ZITR <sup>(2)</sup>    | Z16-2        | Industrial      | SY100EL15ZI                                 | Sn-Pb          |
| SY10EL15ZG <sup>(3)</sup>       | Z16-2        | Industrial      | SY10EL15ZG with Pb-Free bar-line indicator  | Pb-Free NiPdAu |
| SY10EL15ZGTR <sup>(2, 3)</sup>  | Z16-2        | Industrial      | SY10EL15ZG with Pb-Free bar-line indicator  | Pb-Free NiPdAu |
| SY100EL15ZG <sup>(3)</sup>      | Z16-2        | Industrial      | SY100EL15ZG with Pb-Free bar-line indicator | Pb-Free NiPdAu |
| SY100EL15ZGTR <sup>(2, 3)</sup> | Z16-2        | Industrial      | SY100EL15ZG with Pb-Free bar-line indicator | Pb-Free NiPdAu |

## Notes:

1. Contact factory for die availability. Dice are guaranteed at  $T_A = 25^\circ\text{C}$ , DC Electricals only.
2. Tape and Reel.
3. Pb-Free package is recommended for new designs.

## PIN NAMES

| Pin  | Function                   |
|------|----------------------------|
| CLK  | Differential Clock Inputs  |
| SCLK | Synchronous Clock Input    |
| EN   | Synchronous Enable         |
| SEL  | Clock Select Input         |
| VBB  | Reference Output           |
| Q0-3 | Differential Clock Outputs |

## TRUTH TABLE

| CLK | SCLK | SEL | EN | Q  |
|-----|------|-----|----|----|
| L   | X    | L   | L  | L  |
| H   | X    | L   | L  | H  |
| X   | L    | H   | L  | L  |
| X   | H    | H   | L  | H  |
| X   | X    | X   | H  | L* |

\* On next negative transition of CLK or SCLK

**ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>**

| Symbol            | Rating                                     | Value        | Unit |
|-------------------|--------------------------------------------|--------------|------|
| VEE               | Power Supply (V <sub>CC</sub> = 0V)        | –8.0 to 0    | VDC  |
| V <sub>I</sub>    | Input Voltage (V <sub>CC</sub> = 0V)       | 0 to –6.0    | VDC  |
| I <sub>OUT</sub>  | Output Current<br>–Continuous<br>–Surge    | 50<br>100    | mA   |
| T <sub>LEAD</sub> | Lead Temperature Range (soldering, 20sec.) | +260         | °C   |
| T <sub>A</sub>    | Operating Temperature Range                | –40 to +85   | °C   |
| VEE               | Operating Range <sup>(1),(2)</sup>         | –5.7 to –4.2 | V    |

**NOTES:**

1. Absolute maximum rating, beyond which, device life may be impaired, unless otherwise specified on an individual data sheet.
2. Parametric values specified at:
 

|                 |                  |
|-----------------|------------------|
| 100EL15 Series: | –4.2V to –5.5V.  |
| 10EL15 Series   | –4.75V to –5.5V. |

**10EL DC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min.) to V<sub>EE</sub> (Max.); V<sub>CC</sub> = GND<sup>(1)</sup>

| Symbol          | Parameter                | T <sub>A</sub> = –40°C |       | T <sub>A</sub> = 0°C |       | T <sub>A</sub> = +25°C |      |       | T <sub>A</sub> = +85°C |       | Unit |
|-----------------|--------------------------|------------------------|-------|----------------------|-------|------------------------|------|-------|------------------------|-------|------|
|                 |                          | Min.                   | Max.  | Min.                 | Max.  | Min.                   | Typ. | Max.  | Min.                   | Max.  |      |
| V <sub>OH</sub> | Output HIGH Voltage      | –1080                  | –890  | –1020                | –840  | –980                   | —    | –810  | –910                   | –720  | mV   |
| V <sub>OL</sub> | Output LOW Voltage       | –1950                  | –1650 | –1950                | –1630 | –1950                  | —    | –1630 | –1950                  | –1595 | mV   |
| V <sub>IH</sub> | Input HIGH Voltage       | –1230                  | –890  | –1170                | –840  | –1130                  | —    | –810  | –1060                  | –720  | mV   |
| V <sub>IL</sub> | Input LOW Voltage        | –1950                  | –1500 | –1950                | –1480 | –1950                  | —    | –1480 | –1950                  | –1445 | mV   |
| I <sub>IH</sub> | Input High Current       | —                      | 150   | —                    | 150   | —                      | —    | 150   | —                      | 150   | μA   |
| I <sub>IL</sub> | Input LOW Current        | 0.5                    | —     | 0.5                  | —     | 0.5                    | —    | —     | 0.5                    | —     | μA   |
| I <sub>EE</sub> | Power Supply Current     | —                      | 35    | —                    | 35    | —                      | 25   | 35    | —                      | 38    | mA   |
| V <sub>BB</sub> | Output Reference Voltage | –1.38                  | –1.26 | –1.38                | –1.26 | –1.38                  | —    | –1.26 | –1.38                  | –1.26 | V    |

**NOTE:**

1. 10EL circuits are designed to meet the DC specifications shown in the table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500lfpm is maintained. Outputs are terminated through a 50Ω resistor to –2.0V except where otherwise specified on the individual data sheets.

**100EL DC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min.) to V<sub>EE</sub> (Max.); V<sub>CC</sub> = GND<sup>(1)</sup>

| Symbol           | Parameter                          | T <sub>A</sub> = -40°C |       | T <sub>A</sub> = 0°C |       | T <sub>A</sub> = +25°C |       |       | T <sub>A</sub> = +85°C |       | Unit |
|------------------|------------------------------------|------------------------|-------|----------------------|-------|------------------------|-------|-------|------------------------|-------|------|
|                  |                                    | Min.                   | Max.  | Min.                 | Max.  | Min.                   | Typ.  | Max.  | Min.                   | Max.  |      |
| V <sub>OH</sub>  | Output HIGH Voltage <sup>(2)</sup> | -1085                  | -880  | -1025                | -880  | -1025                  | -955  | -880  | -1025                  | -880  | mV   |
| V <sub>OL</sub>  | Output LOW Voltage <sup>(2)</sup>  | -1830                  | -1555 | -1810                | -1620 | -1810                  | -1705 | -1620 | -1810                  | -1620 | mV   |
| V <sub>OHA</sub> | Output HIGH Voltage <sup>(3)</sup> | -1095                  | —     | -1035                | —     | -1035                  | —     | —     | -1035                  | —     | mV   |
| V <sub>OLA</sub> | Output LOW Voltage <sup>(3)</sup>  | —                      | -1555 | —                    | -1610 | —                      | —     | -1610 | —                      | -1610 | mV   |
| V <sub>IH</sub>  | Input HIGH Voltage                 | -1165                  | -880  | -1165                | -880  | -1165                  | —     | -880  | -1165                  | -880  | mV   |
| V <sub>IL</sub>  | Input LOW Voltage                  | -1810                  | -1475 | -1810                | -1475 | -1810                  | —     | -1475 | -1810                  | -1475 | mV   |
| I <sub>IH</sub>  | Input High Current                 | —                      | 150   | —                    | 150   | —                      | —     | 150   | —                      | 150   | μA   |
| I <sub>IL</sub>  | Input LOW Current <sup>(4)</sup>   | 0.5                    | —     | 0.5                  | —     | 0.5                    | —     | —     | 0.5                    | —     | μA   |
| I <sub>EE</sub>  | Power Supply Current               | —                      | 35    | —                    | 35    | —                      | 25    | 35    | —                      | 38    | mA   |
| V <sub>BB</sub>  | Output Reference Voltage           | -1.38                  | -1.26 | -1.38                | -1.26 | -1.38                  | —     | -1.26 | -1.38                  | -1.26 | V    |

**NOTES:**

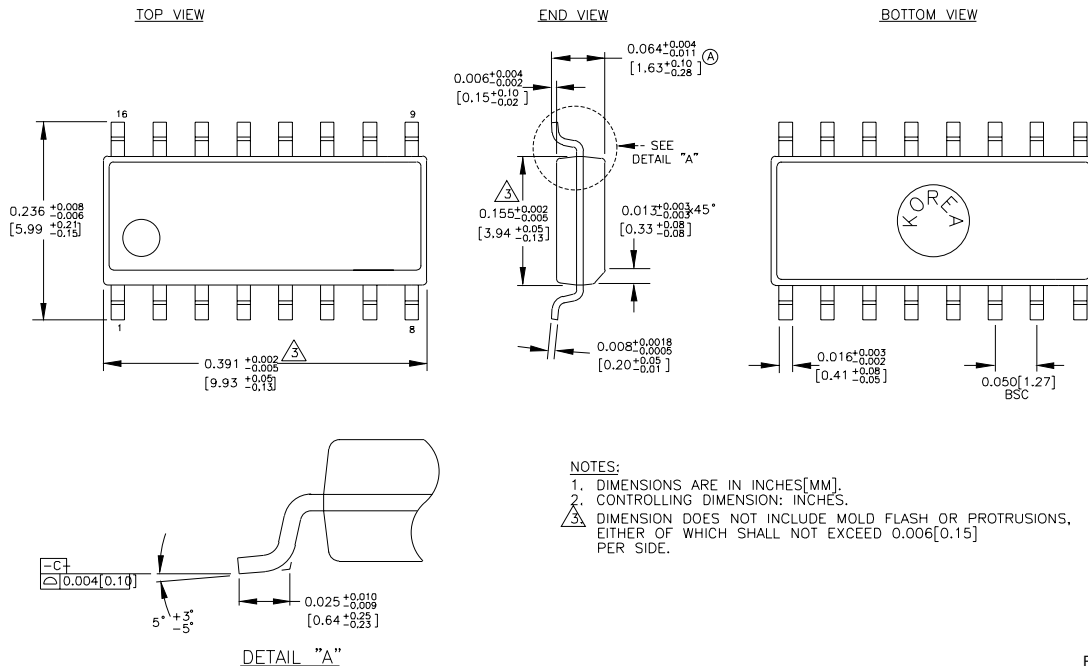
1. This table replaces the three traditionally seen in ECL 100K data books. The same DC parameter values at V<sub>EE</sub> = -4.5V now apply across the full V<sub>EE</sub> range of -4.2V to -5.5V. Outputs are terminated through a 50Ω resistor to -2.0V except where otherwise specified on the individual data sheets.
2. V<sub>IN</sub> = V<sub>IH</sub>(Max) or V<sub>IL</sub>(Min).
3. V<sub>IN</sub> = V<sub>IH</sub>(Min) or V<sub>IL</sub>(Max).
4. V<sub>IN</sub> = V<sub>IL</sub>(Max).

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

| Symbol                           | Parameter                                                          | T <sub>A</sub> = -40°C |                   | T <sub>A</sub> = 0°C |                   | T <sub>A</sub> = +25°C |             |                   | T <sub>A</sub> = +85°C |                   | Unit |
|----------------------------------|--------------------------------------------------------------------|------------------------|-------------------|----------------------|-------------------|------------------------|-------------|-------------------|------------------------|-------------------|------|
|                                  |                                                                    | Min.                   | Max.              | Min.                 | Max.              | Min.                   | Typ.        | Max.              | Min.                   | Max.              |      |
| t <sub>PD</sub>                  | Propagation Delay<br>CLK to Q (Diff)<br>CLK to Q (SE)<br>SCLK to Q | 460<br>410<br>410      | 660<br>710<br>710 | 470<br>420<br>420    | 670<br>720<br>720 | 470<br>420<br>420      | —<br>—<br>— | 670<br>720<br>720 | 500<br>450<br>470      | 700<br>750<br>750 | ps   |
| t <sub>skew</sub>                | Part-to-Part Skew <sup>(1)</sup><br>Within-Device Skew             | —<br>—                 | 200<br>50         | —<br>—               | 200<br>50         | —<br>—                 | —<br>—      | 200<br>50         | —<br>—                 | 200<br>50         | ps   |
| t <sub>S</sub>                   | Setup Time $\overline{EN}$                                         | 150                    | —                 | 150                  | —                 | 150                    | —           | —                 | 150                    | —                 | ps   |
| t <sub>H</sub>                   | Hold Time $\overline{EN}$                                          | 400                    | —                 | 400                  | —                 | 400                    | —           | —                 | 400                    | —                 | ps   |
| V <sub>PP</sub>                  | Minimum Input CLK Swing                                            | 250                    | —                 | 250                  | —                 | 250                    | —           | —                 | 250                    | —                 | mV   |
| V <sub>CMR</sub>                 | Common Mode CLK Range                                              | -2.0                   | -0.4              | -2.0                 | -0.4              | -2.0                   | —           | -0.4              | -2.0                   | -0.4              | V    |
| t <sub>r</sub><br>t <sub>f</sub> | Output Rise/Fall Times Q<br>(20% – 80%)                            | —<br>—                 | —<br>—            | 325<br>325           | 575<br>575        | 325<br>325             | —<br>—      | 575<br>575        | 325<br>325             | 575<br>575        | ps   |

**NOTE:**

1. Skews are specified for identical LOW-to-HIGH or HIGH-to-LOW transitions.

**16-PIN SOIC .150" WIDE (Z16-2)**

Rev. 02

**MICREL, INC. 2180 FORTUNE DRIVE SAN JOSE, CA 95131 USA**TEL + 1 (408) 944-0800 FAX + 1 (408) 474-1000 WEB <http://www.micrel.com>

The information furnished by Micrel in this datasheet is believed to be accurate and reliable. However, no responsibility is assumed by Micrel for its use. Micrel reserves the right to change circuitry and specifications at any time without notification to the customer.

Micrel Products are not designed or authorized for use as components in life support appliances, devices or systems where malfunction of a product can reasonably be expected to result in personal injury. Life support devices or systems are devices or systems that (a) are intended for surgical implant into the body or (b) support or sustain life, and whose failure to perform can be reasonably expected to result in a significant injury to the user. A Purchaser's use or sale of Micrel Products for use in life support appliances, devices or systems is at Purchaser's own risk and Purchaser agrees to fully indemnify Micrel for any damages resulting from such use or sale.

© 2006 Micrel, Incorporated.