

FEATURES

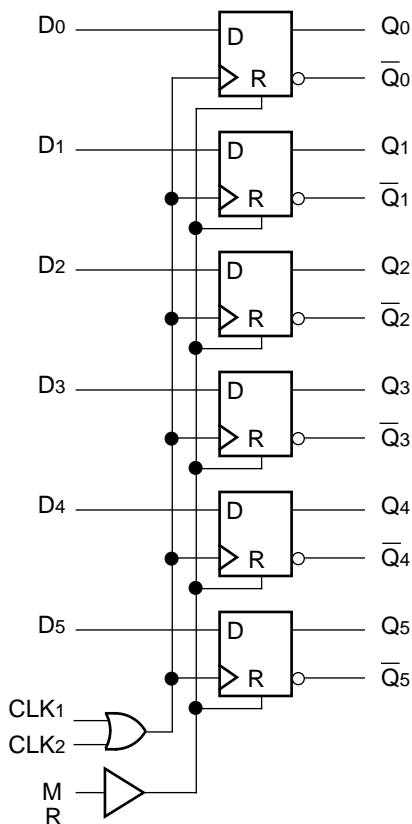
- 1100MHz toggle frequency
- Extended 100E VEE range of -4.2V to -5.46V
- Differential outputs
- Asynchronous Master Reset
- Dual clocks
- Fully compatible with industry standard 10KH, 100K ECL levels
- Internal 75KΩ input pulldown resistors
- Fully compatible with Motorola MC10E/100E151
- Available in 28-pin PLCC package

DESCRIPTION

The SY10/100E151 offer 6 edge-triggered, high-speed, master-slave D-type flip-flops with differential outputs, designed for use in new, high-performance ECL systems. The two external clock signals (CLK1, CLK2) are gated through a logical OR operation before use as clocking control for the flip-flops. Data is clocked into the flip-flops on the rising edge of either CLK1 or CLK2 (or both). When both CLK1 and CLK2 are at a logic LOW, data enters the master and is transferred to the slave when either CLK1 or CLK2 (or both) go HIGH.

The MR (Master Reset) signal operates asynchronously to make all Q outputs go to a logic LOW.

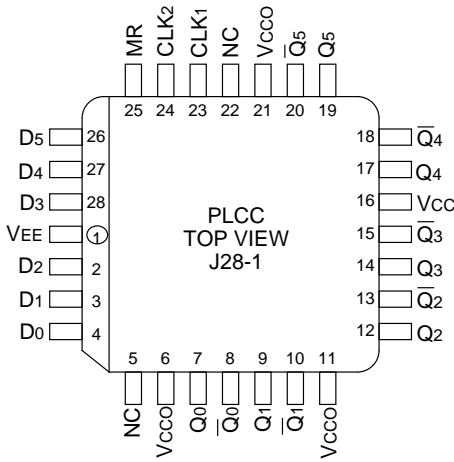
BLOCK DIAGRAM



PIN NAMES

| Pin | Function |
|---------------------|-------------------|
| D0-D5 | Data Inputs |
| CLK1, CLK2 | Clock Inputs |
| MR | Master Reset |
| Q0-Q5 | True Outputs |
| $\bar{Q}0-\bar{Q}5$ | Inverting Outputs |
| VCC0 | Vcc to Output |

PACKAGE/ORDERING INFORMATION



28-Pin PLCC (J28-1)

Ordering Information⁽¹⁾

| Part Number | Package Type | Operating Range | Package Marking | Lead Finish |
|---------------------------------|--------------|-----------------|---|-------------|
| SY10E151JI | J28-1 | Industrial | SY10E151JI | Sn-Pb |
| SY10E151JITR ⁽²⁾ | J28-1 | Industrial | SY10E151JI | Sn-Pb |
| SY10E151JC | J28-1 | Commercial | SY10E151JC | Sn-Pb |
| SY10E151JCTR ⁽²⁾ | J28-1 | Commercial | SY10E151JC | Sn-Pb |
| SY100E151JC | J28-1 | Commercial | SY100E151JC | Sn-Pb |
| SY100E151JCTR ⁽²⁾ | J28-1 | Commercial | SY100E151JC | Sn-Pb |
| SY10E151JY ⁽³⁾ | J28-1 | Industrial | SY10E151JY with Pb-Free bar-line indicator | Matte-Sn |
| SY10E151JYTR ^(2, 3) | J28-1 | Industrial | SY10E151JY with Pb-Free bar-line indicator | Matte-Sn |
| SY100E151JZ ⁽³⁾ | J28-1 | Commercial | SY100E151JZ with Pb-Free bar-line indicator | Matte-Sn |
| SY100E151JZTR ^(2, 3) | J28-1 | Commercial | SY100E151JZ with Pb-Free bar-line indicator | Matte-Sn |

Notes:

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

TRUTH TABLES⁽¹⁾

Asynchronous Operation

| Inputs | | | | Output |
|----------------|------------------|------------------|----|------------------------|
| D _n | CLK ₁ | CLK ₂ | MR | Q _n (t + 1) |
| X | X | X | H | L |

Note:

- 1. H = HIGH Voltage Level
- L = LOW Voltage Level
- X = Don't Care
- t = Time before positive CLK transition
- t+1 = Time after positive CLK transition
- u = LOW-to-HIGH transition

Synchronous Operation

| Inputs | | | | Output |
|----------------|------------------|------------------|----|------------------------|
| D _n | CLK ₁ | CLK ₂ | MR | Q _n (t + 1) |
| L | u | L | L | L |
| H | u | L | L | H |
| L | L | u | L | L |
| H | L | u | L | H |
| X | H | u | L | Q _n (t) |
| X | u | H | L | Q _n (t) |
| X | L | L | L | Q _n (t) |

DC ELECTRICAL CHARACTERISTICS⁽¹⁾

V_{EE} = V_{EE} (Min.) to V_{EE} (Max.); V_{CC} = V_{CC0} = GND

| Symbol | Parameter | T _A = 0°C | | | T _A = +25°C | | | T _A = +85°C | | | Unit | Condition |
|-----------------|----------------------|----------------------|------|------|------------------------|------|------|------------------------|------|------|------|-----------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| I _{IH} | Input HIGH Current | — | — | 150 | — | — | 150 | — | — | 150 | μA | — |
| I _{EE} | Power Supply Current | — | 65 | 78 | — | 65 | 78 | — | 65 | 78 | mA | — |
| | | 10E | 65 | 78 | — | 65 | 78 | — | 65 | 78 | | |
| | | 100E | 65 | 78 | — | 65 | 78 | — | 75 | 90 | | |

Note:

- 1. Specification for packaged product only.

AC ELECTRICAL CHARACTERISTICS⁽²⁾

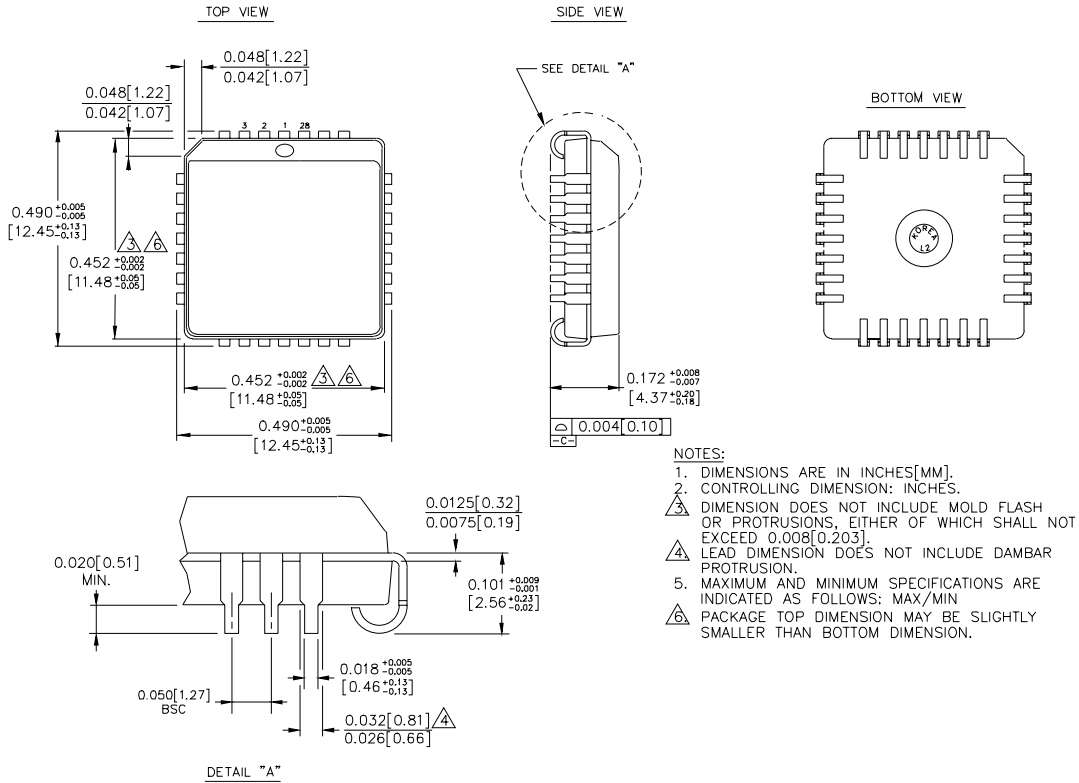
V_{EE} = V_{EE} (Min.) to V_{EE} (Max.); V_{CC} = V_{CC0} = GND

| Symbol | Parameter | T _A = 0°C | | | T _A = +25°C | | | T _A = +85°C | | | Unit | Condition |
|----------------------------------|--|----------------------|------|------|------------------------|------|------|------------------------|------|------|------|-----------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| f _{MAX} | Max. Toggle Frequency | 1100 | 1400 | — | 1100 | 1400 | — | 1100 | 1400 | — | MHz | — |
| t _{PD} | Propagation Delay to Output CLK MR | 475 | 650 | 800 | 475 | 650 | 800 | 475 | 650 | 800 | ps | — |
| | | 475 | 650 | 850 | 475 | 650 | 850 | 475 | 650 | 850 | | |
| t _S | Set-up Time, D | 0 | -175 | — | 0 | -175 | — | 0 | -175 | — | ps | — |
| t _H | Hold Time, D | 350 | 175 | — | 350 | 175 | — | 350 | 175 | — | ps | — |
| t _{RR} | Reset Recovery Time | 750 | 550 | — | 750 | 550 | — | 750 | 550 | — | ps | — |
| t _{PW} | Minimum Pulse Width CLK, MR | 400 | — | — | 400 | — | — | 400 | — | — | ps | — |
| t _{skew} | Within-Device Skew | — | 65 | — | — | 65 | — | — | 65 | — | ps | 1 |
| t _r t _f | Rise/Fall Time 20% to 80% | 300 | 450 | 700 | 300 | 450 | 700 | 300 | 450 | 700 | ps | — |

Note:

- 1. Within-device skew is defined as identical transitions on similar paths through a device.
- 2. Specification for packaged product only.

28-PIN PLCC (J28-1)



Rev. 03

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 data sheet 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.