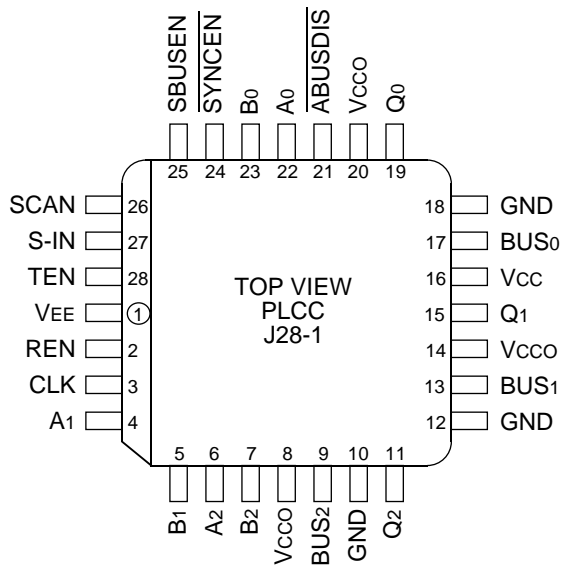


## FEATURES

- 1500ps max. clock to bus (data transmit)
- 1000ps max. clock to Q (data receive)
- Extended 100E VEE range of -4.2V to -5.5V
- 25Ω cutoff bus outputs
- 50Ω receiver outputs
- Scannable implementation of E336
- Synchronous and asynchronous bus enables
- Non-inverting data path
- Bus outputs feature internal edge slow-down capacitors
- Additional package ground pins
- Fully compatible with industry standard 10KH, 100K ECL levels
- Internal 75KΩ input pulldown resistors
- Fully compatible with Motorola MC10E/100E337
- Available in 28-pin PLCC package

## PIN CONFIGURATION



## DESCRIPTION

The SY10/100E337 are 3-bit registered bus transceivers with scan designed for use in new, high-performance ECL systems. The bus outputs (BUS<sub>0</sub>–BUS<sub>2</sub>) are designed to drive a 25Ω bus; the receive outputs (Q<sub>0</sub>–Q<sub>2</sub>) are designed for 50Ω. The bus outputs feature a normal logic HIGH level (V<sub>OH</sub>) and a cutoff LOW level of -2.0V and the output emitter-follower is “off”, presenting a high impedance to the bus. The bus outputs also feature edge slow-down capacitors.

Both drive and receive sides feature the same logic, including a loopback path to hold data. The LOAD/HOLD function is controlled by Transmit Enable (TEN) and Receive Enable (REN) on the transmit and receive sides, respectively, with a HIGH selecting LOAD. The implementation of the E337 Receive Enable differs from that of the E336.

A synchronous bus enable (SBUSEN) is provided for normal, non-scan operation. The asynchronous bus disable ( $\overline{\text{ABUSDIS}}$ ) disables the bus for scan mode.

The  $\overline{\text{SYNCEN}}$  input allows either synchronous or asynchronous re-enabling after disabling with  $\overline{\text{ABUSDIS}}$ . An alternative use is asynchronous-only operation with  $\overline{\text{ABUSDIS}}$ , in which case  $\overline{\text{SYNCEN}}$  is tied LOW.  $\overline{\text{SYNCEN}}$  is implemented as an overriding SET control to the enable flip-flop.

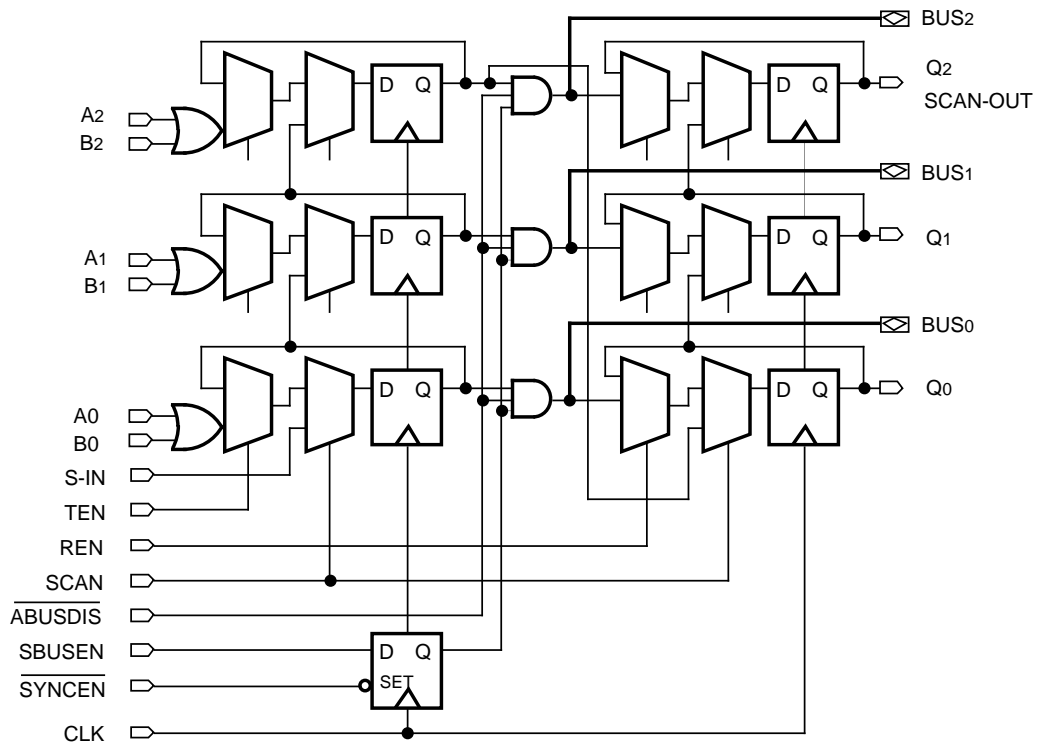
Scan mode is selected by a logic HIGH at the SCAN input. Scan input data is shifted in through S-IN, and output data appears at the Q2 output.

All registers are clocked on the rising edge of CLK. Additional lead-frame grounding is provided through the ground pins (GND) which should be connected to 0V. The GND pins are not electrically connected to the chip.

## PIN NAMES

| Pin                                | Function  |
|------------------------------------|---|
| A <sub>0</sub> –A <sub>2</sub>     | Data Inputs A   |
| B <sub>0</sub> –B <sub>2</sub>     | Data Inputs B   |
| S-IN                               | Serial (Scan) Data Input  |
| TEN, REN                           | LOAD/HOLD Controls  |
| SCAN                               | Scan Control  |
| $\overline{\text{ABUSDIS}}$        | Asynchronous Bus Disable  |
| SBUSEN                             | Synchronous Bus Enable  |
| $\overline{\text{SYNCEN}}$         | Synchronous Enable Control  |
| CLK                                | Clock   |
| BUS <sub>0</sub> –BUS <sub>2</sub> | 25Ω Cutoff BUS Outputs  |
| Q <sub>0</sub> –Q <sub>2</sub>     | Receive Data Outputs (Q <sub>2</sub> serves as SCAN_OUT in scan mode) |
| VCCO                               | Vcc to Output   |

**BLOCK DIAGRAM**



**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.  |      |           |   |
| V <sub>CUT</sub> | Cut-off Output Voltage                 | -2.10                | —    | -2.03 | -2.10                  | —    | -2.03 | -2.10                  | —    | -2.03 | V    | 1         |   |
| I <sub>IH</sub>  | Input HIGH Current<br>All Other Inputs | —                    | —    | 150   | —                      | —    | 150   | —                      | —    | 150   | μA   | —         |   |
| I <sub>EE</sub>  | Power Supply Current                   | 10E                  | —    | 145   | 174                    | —    | 145   | 174                    | —    | 145   | 174  | mA        | — |
|                  |  | 100E                 | —    | 145   | 174                    | —    | 125   | 174                    | —    | 167   | 200  |           |   |
|                  |  |                      |      |       |                        |      |       |                        |      |       |      |           |   |

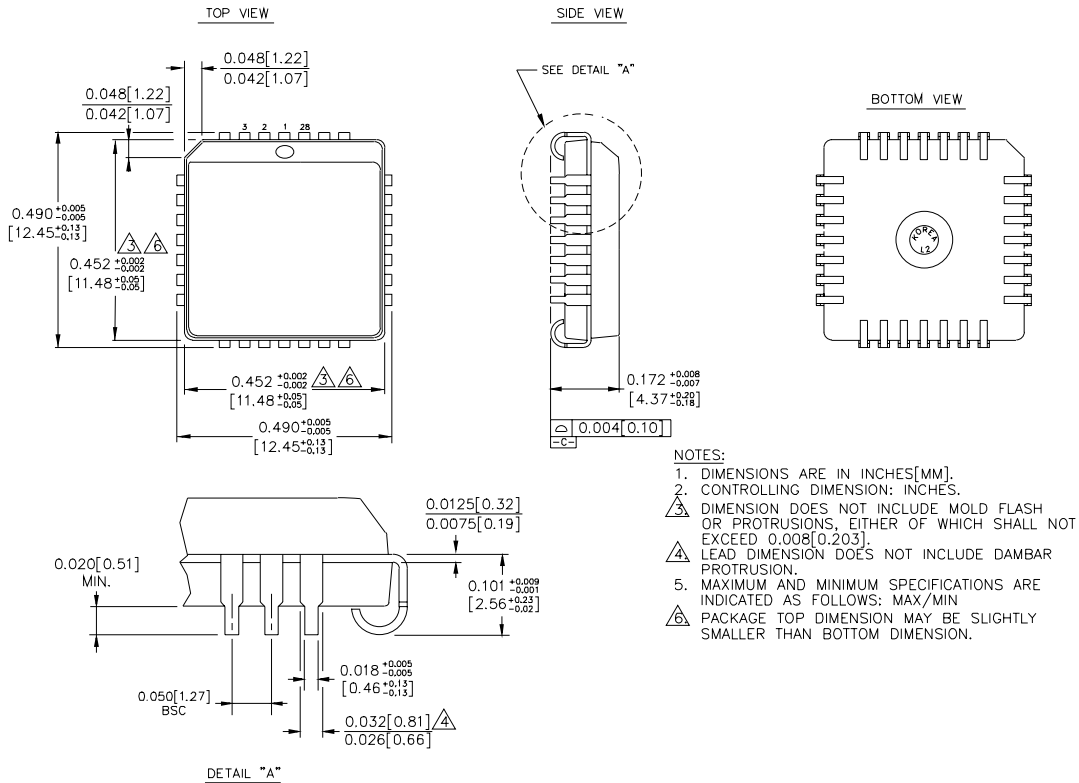
**NOTE:**1. Applies to BUS outputs only. Measured with V<sub>TT</sub> = -2.10V.**AC ELECTRICAL CHARACTERISTICS**V<sub>EE</sub> = V<sub>EE</sub> (Min.) to V<sub>EE</sub> (Max.); V<sub>CC</sub> = V<sub>CCO</sub> = GND

| 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.                         |      |           |
| t <sub>PLH</sub><br>t <sub>PHL</sub> | Propagation Delay to Output<br>CLK to Q<br>CLK to BUS<br><u>ABUSDIS</u><br>SYN <sub>CEN</sub>                              | 450<br>800<br>500<br>800 | —<br>—<br>—<br>— | 1000<br>1800<br>1500<br>1800 | 450<br>800<br>500<br>800 | —<br>—<br>—<br>— | 1000<br>1800<br>1500<br>1800 | 450<br>800<br>500<br>800 | —<br>—<br>—<br>— | 1000<br>1800<br>1500<br>1800 | ps   | —         |
| t <sub>S</sub>                       | Set-up Time<br>BUS<br>SBUSEN<br>Data, S-IN<br>TEN, REN, SCAN   | 350<br>100<br>400<br>550 | —<br>—<br>—<br>— | —<br>—<br>—<br>—             | 350<br>100<br>400<br>550 | —<br>—<br>—<br>— | —<br>—<br>—<br>—             | 350<br>100<br>400<br>550 | —<br>—<br>—<br>— | —<br>—<br>—<br>—             | ps   | —         |
| t <sub>H</sub>                       | Hold Time<br>BUS<br>SBUSEN<br>Data, S-IN<br>TEN, REN, SCAN   | 350<br>500<br>350<br>200 | —<br>—<br>—<br>— | —<br>—<br>—<br>—             | 350<br>500<br>350<br>200 | —<br>—<br>—<br>— | —<br>—<br>—<br>—             | 350<br>500<br>350<br>200 | —<br>—<br>—<br>— | —<br>—<br>—<br>—             | ps   | —         |
| t <sub>PW</sub>                      | Minimum Pulse Width  | 400                      | —                | —                            | 400                      | —                | —                            | 400                      | —                | —                            | ps   | —         |
| t <sub>r</sub><br>t <sub>f</sub>     | Rise/Fall Time<br>20% to 80% (Q <sub>n</sub> )<br>20% to 80% (BUS <sub>n</sub> Rise)<br>20% to 80% (BUS <sub>n</sub> Fall) | 300<br>500<br>300        | —<br>—<br>—      | 800<br>1000<br>800           | 300<br>500<br>300        | —<br>—<br>—      | 800<br>1000<br>800           | 300<br>500<br>300        | —<br>—<br>—      | 800<br>1000<br>800           | ps   | —         |

**PRODUCT ORDERING CODE**

| Ordering Code | Package Type | Operating Range |
|---------------|--------------|-----------------|
| SY10E337JC    | J28-1        | Commercial      |
| SY10E337JCTR  | J28-1        | Commercial      |
| SY100E337JC   | J28-1        | Commercial      |
| SY100E337JCTR | J28-1        | Commercial      |

**28 LEAD PLCC (J28-1)**



Rev. 03

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