

# HD10124

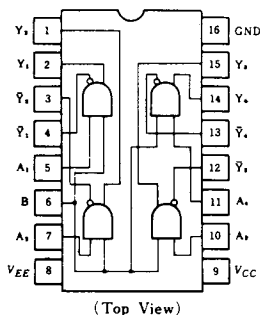
## Quadruple TTL to ECL Translators

The HD10124 is a quad translator for interfacing data and control signals between a saturated logic section and the ECL section of digital systems. The device has TTL compatible inputs, and ECL complementary open-emitter outputs that allow use as an inverting/noninverting translator or as a differential line driver. When the common strobe input is at the low logic level, it forces all true outputs to a ECL high logic state.

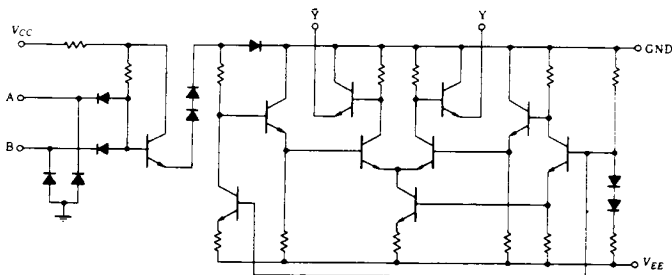
Power supply requirements are ground, +5.0V, and -5.2V. The DC levels are standard or Schottky TTL in, ECL 10K out.

An advantage of this device is that TTL level information can be transmitted differentially, via balanced twisted pair lines, to the ECL equipment, where the signal can be received by any of the ECL receivers or the HD10125 ECL to TTL translator.

### PIN ARRANGEMENT



### CIRCUIT SCHEMATIC

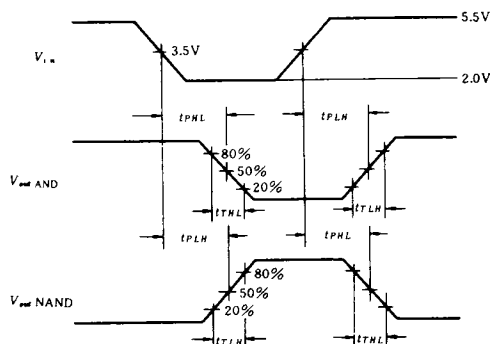
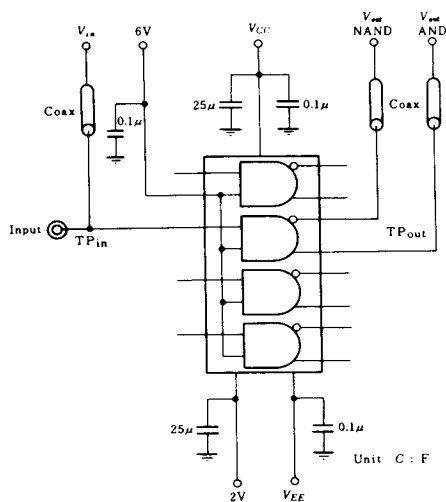


### DC CHARACTERISTICS ( $V_{EE} = -5.2V$ , $V_{CC} = +5.0V$ , $T_a = -30 \sim +85^\circ C$ )

| Item                     | Symbol    | Test Condition                        | min   | typ    | max    | Unit    |
|--------------------------|-----------|---------------------------------------|-------|--------|--------|---------|
| Supply Current           | $I_{EE}$  |                                       | 25°C  | —      | 66     | mA      |
|                          | $I_{CCH}$ | All inputs = 4V                       | 25°C  | —      | 16     | mA      |
|                          | $I_{CCL}$ | All inputs = 0V                       | 25°C  | —      | 25     | mA      |
| Input Current            | $I_{IH}$  | $V_{IH} = 2.4V$ , Other inputs = 0.4V | 25°C  | —      | 50     | $\mu A$ |
|                          |           |                                       |       | —      | 200    |         |
|                          | $I_{IL}$  | $V_{IL} = 0.4V$ , Other inputs = 4V   | 25°C  | -3.2   | —      | mA      |
|                          |           |                                       |       | -12.8  | —      |         |
|                          | $I_I$     | $V_{IH} = 5.5V$ , Other inputs = 0V   | 25°C  | —      | 1      | mA      |
| Input Clamp Voltage      | $V_{IK}$  | $I_{IH} = -10mA$ , Other inputs open  | 25°C  | -1.5   | —      | V       |
| Output Voltage           | $V_{OH}$  | $V_{IH} = 4V$ or $V_{IL} = 0.4V$      | -30°C | -1.060 | —      | V       |
|                          |           |                                       | 25°C  | -0.960 | —      |         |
|                          |           |                                       | 85°C  | -0.890 | —      |         |
|                          | $V_{OL}$  | $V_{IH} = 4V$ or $V_{IL} = 0.4V$      | -30°C | -1.890 | —      | V       |
|                          |           |                                       | 25°C  | -1.850 | —      |         |
|                          |           |                                       | 85°C  | -1.825 | —      |         |
| Output Threshold Voltage | $V_{OHA}$ | $V_{IH} = 2.0V$ or $V_{ILA} = 1.10V$  | -30°C | -1.080 | —      | V       |
|                          |           | $V_{IH} = 1.80V$ or $V_{ILA} = 1.10V$ | 25°C  | -0.980 | —      |         |
|                          |           | $V_{IH} = 1.80V$ or $V_{ILA} = 0.90V$ | 85°C  | -0.910 | —      |         |
|                          | $V_{OLA}$ | $V_{ILA} = 1.10V$ or $V_{IH} = 2.0V$  | -30°C | —      | -1.655 | V       |
|                          |           | $V_{ILA} = 1.10V$ or $V_{IH} = 1.80V$ | 25°C  | —      | -1.630 |         |
|                          |           | $V_{ILA} = 0.90V$ or $V_{IH} = 1.80V$ | 85°C  | —      | -1.595 |         |

**■ AC CHARACTERISTICS** ( $V_{EE} = -3.2V$ ,  $V_{CC} = +7.0V$ ,  $GND = +2.0V$ ,  $T_a = -30 \sim +85^\circ C$ )

| Item                   |              | Symbol    | Test Condition | min   | typ | max | Unit |    |
|------------------------|--------------|-----------|----------------|-------|-----|-----|------|----|
| Propagation Delay Time | In-phase     | $t_{PLH}$ | $R_L=50\Omega$ | -30°C | 1.0 | —   | 6.8  | ns |
|                        |              |           |                | 25°C  | 1.5 | 3.5 | 6.0  |    |
|                        |              | 85°C      |                | 1.0   | —   | 6.8 |      |    |
|                        |              | $t_{PHL}$ |                | -30°C | 1.0 | —   | 6.8  | ns |
|                        |              |           |                | 25°C  | 1.5 | 3.5 | 6.0  |    |
|                        |              |           |                | 85°C  | 1.0 | —   | 6.8  |    |
|                        | Out-of-phase | $t_{PLH}$ |                | -30°C | 1.0 | —   | 6.0  | ns |
|                        |              |           |                | 25°C  | 1.5 | 3.5 | 6.0  |    |
|                        |              | 85°C      |                | 1.5   | —   | 6.8 |      |    |
|                        |              | $t_{PHL}$ |                | -30°C | 1.5 | —   | 6.8  | ns |
|                        |              |           |                | 25°C  | 1.5 | 3.5 | 6.0  |    |
|                        |              |           |                | 85°C  | 1.0 | —   | 6.0  |    |
| Rise/Fall Time         | $t_{TLH}$    | -30°C     | 1.0            | —     | 4.2 | ns  |      |    |
|                        |              | 25°C      | 1.1            | 2.5   | 3.9 |     |      |    |
|                        |              | 85°C      | 1.1            | —     | 4.3 |     |      |    |
|                        | $t_{THL}$    | -30°C     | 1.0            | —     | 4.2 | ns  |      |    |
|                        |              | 25°C      | 1.1            | 2.5   | 3.9 |     |      |    |
|                        |              | 85°C      | 1.1            | —     | 4.3 |     |      |    |

**■ TEST CIRCUIT**

**Notes)**

1.  $50\Omega$  termination to ground located in each scope channel input. All input and output cables to the scope are equal lengths of  $50\Omega$  coaxial cable.
2. Wire length should be  $< 6.35\text{mm}$  (1/4 inch) from TPin to input pin and TPout to output pin.
3. Input Pulse;  $t_{TLH} = t_{THL} = 5.5 \pm 0.5\text{ns}$  (10 to 90%)
4. Unused outputs connected to a  $50\Omega$  resistor to ground.