

QUAD DIFFERENTIAL LINE DRIVER

WITH SEPARATE LOGIC BIAS AND DRIVER BIAS
SUPPLIES, AND ENABLE FUNCTION

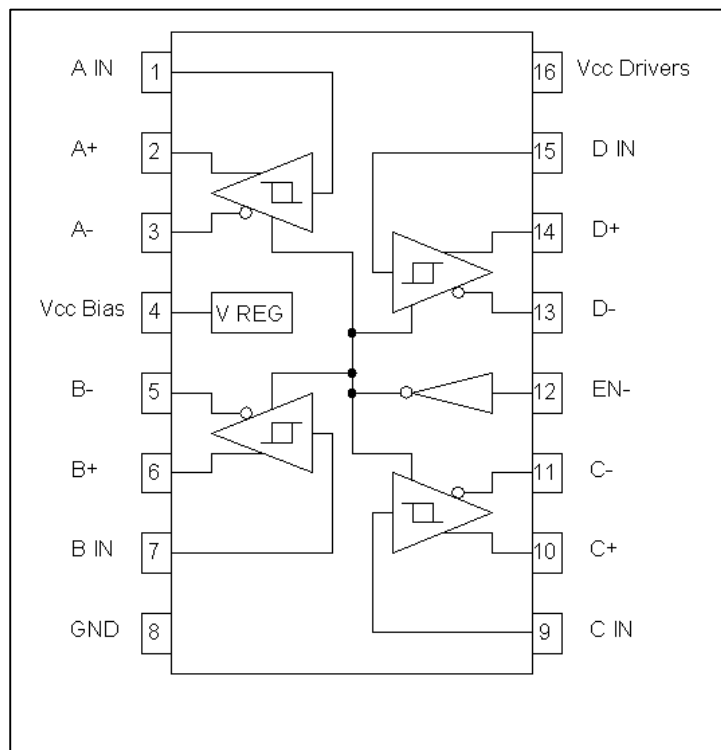
ET7272

FEATURES

- Supply Voltage Range 3.5V to 30V
- Operation to 800KHz
- CMOS and TTL Compatible Inputs
- Separate logic bias and driver supply pins
- Optional single supply operation for moderate power applications
- High Impedance Buffered Inputs with Hysteresis may be driven directly by phototransistors
- Tri-State outputs
- 80mA peak SINK/SOURCE current
- Outputs Protected by Thermal Shut-Down

APPLICATIONS

- Optical Encoders
- Industrial Controls



DESCRIPTION

These line drivers are pin compatible with 26LS31 in applications where pin 4 = 5V and pin 12 = GND. Internal clamp diodes allow trouble-free operation when driving cable lengths exceeding 100m. Split supplies are provided to minimize standby power dissipation in high voltage applications. The logic should be powered from a regulated 5V supply at the VccBias pin. The output stages may then be powered by a separate supply at VccDrivers, up to 30V. Output voltage swings of 0.3V to VCC-1.9V are typical. The outputs are protected against shorts to ground, shorts to Vcc and to other outputs, by a two-fold scheme of current limiting and thermal shutdown. This assures highly reliable operation in harsh environments. Heat-sinking may be accomplished at pin 8 which is directly connected to the ASIC substrate.

ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Min. | Max. | Units | Ref. |
|-----------------------------|----------|------|------|-------|------|
| Operating Temperature Range | T_A | -55 | 115 | °C | |
| Supply Voltage Range(both) | V_{CC} | 4.5 | 30 | V | |

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ELECTRICAL CHARACTERISTICS

Unless otherwise specified, $T_A = 25^\circ\text{C}$ and $\text{EN-} < 0.8\text{V}$.

| Parameters | Symbol | Min. | Typ. | Max. | Units | Test Conditions |
|--|------------|------|------|------|------------------|--|
| Overtemp Operate Point (junction) ¹ | T_{JOP} | | 172 | | $^\circ\text{C}$ | |
| Overtemp Release Point (junction) ¹ | T_{JRP} | | 136 | | $^\circ\text{C}$ | |
| Vcc Bias Voltage Range | V_{CCB} | 3.5 | 5 | 30 | V | |
| Vcc Drivers Voltage Range | V_{CCD} | 4.5 | 5 | 30 | V | |
| Supply Current V_{CCB1} (BIAS) | I_{CCB1} | | 11.9 | 16.0 | mA | V_{CCB} and $V_{CCD} = 5\text{V}$ |
| Supply Current V_{CCD1} (DRIVERS) | I_{CCD1} | | 2.4 | 3.3 | mA | V_{CCB} and $V_{CCD} = 5\text{V}$ |
| Supply Current V_{CCB2} | I_{CCB2} | | 2.5 | 3.4 | mA | V_{CCB} and $V_{CCD} = 5\text{V}$, $\text{EN-} > 2\text{V}$ |
| Supply Current V_{CCD2} | I_{CCD2} | | 0.0 | 0.1 | mA | V_{CCB} and $V_{CCD} = 5\text{V}$, $\text{EN-} > 2\text{V}$ |
| Supply Current V_{CCB3} | I_{CCB3} | | 12.1 | 18.5 | mA | V_{CCB} and $V_{CCD} = 30\text{V}$ |
| Supply Current V_{CCD3} | I_{CCD3} | | 2.4 | 3.3 | mA | V_{CCB} and $V_{CCD} = 30\text{V}$ |
| Supply Current V_{CCB4} | I_{CCB4} | | 2.6 | 3.5 | mA | V_{CCB} and $V_{CCD} = 5\text{V}$, $\text{EN-} > 2\text{V}$ |
| Supply Current V_{CCD4} | I_{CCD4} | | 0.0 | 0.1 | mA | V_{CCB} and $V_{CCD} = 5\text{V}$, $\text{EN-} > 2\text{V}$ |
| Enable Input Threshold | V_{THE} | 0.8 | 1.5 | 2 | V | |
| Enable Low Level Input Current | I_{ILE} | -10 | 0 | 10 | μA | $V_{IN} = 0\text{V}$, $V_{CCB} = 5\text{V}$ |
| Enable High Level Input Current | I_{IHE} | - | 108 | 150 | μA | $V_{IN} = 5\text{V}$, $V_{CCB} = 5\text{V}$ |
| High Impedance Output Leakage | I_{OZ} | -4.0 | 0.0 | 4.0 | μA | $V_{CCD} = 30\text{V}$, $\text{EN-} > 2\text{V}$, Output at 15V |
| Input Positive-Going Threshold | V_{T+} | 1.05 | 1.25 | 1.45 | V | $V_{CCB} = 5\text{V}$ |
| Input Negative-Going Threshold | V_{T-} | 0.75 | 0.95 | 1.15 | V | $V_{CCB} = 5\text{V}$ |
| Input Hysteresis | V_H | - | 0.3 | - | V | $V_{CCB} = 5\text{V}$ |
| Low Level Input Current | I_{IL} | | -0.1 | -4.0 | μA | $V_{IN} = 0\text{V}$, $V_{CCB} = 5\text{V}$ |
| High Level Input Current | I_{IH} | | 0 | 4.0 | μA | $V_{IN} = 5\text{V}$, $V_{CCB} = 5\text{V}$ |
| Low Level Output1 | V_{OL1} | | 375 | 500 | mV | $I_{OL} = 20\text{mA}$, $V_{CCD} = 5\text{V}$ |
| Low Level Output2 | V_{OL2} | | 370 | 500 | mV | $I_{OL} = 20\text{mA}$, $V_{CCD} = 30\text{V}$ |
| High Level Output1 | V_{OH1} | 2.4 | 2.8 | | V | $I_{OH} = -20\text{mA}$, $V_{CCD} = 5\text{V}$ |
| High Level Output2 | V_{OH2} | 27.7 | 28.1 | | V | $I_{OH} = -20\text{mA}$, $V_{CCD} = 30\text{V}$ |

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AC SWITCHING CHARACTERISTICS

Values given at $V_{CCB} = 5V$, $V_{CCD} = 24V$, $T_A = 25^\circ C$, $C_L = 1000pF$ on all outputs, and $EN = <0.8V$.

| Parameters | Symbol | Min. | Typ. | Max | Units | Test Conditions |
|---|-----------|------|------|-----|-------|-----------------|
| Propagation delay, rising input 50% point to zero crossing of differential outputs | T_{PLH} | | 450 | 630 | ns | |
| Propagation delay, falling input 50% point to zero crossing of differential outputs | T_{PHL} | | 450 | 630 | ns | |
| Output Rise Time | T_R | | 700 | 980 | ns | |
| Output Fall Time | T_F | | 700 | 980 | ns | |

NOTES:

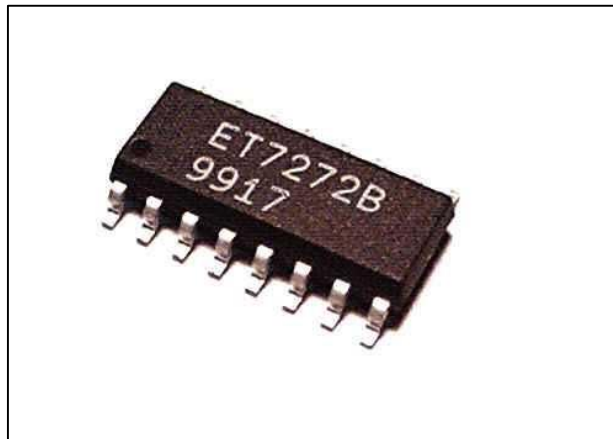
1. This is not a test parameter, but for information only.
2. It may be necessary to clamp the outputs with Schottky diodes when driving extremely long cables with high capacitance between outputs. These diodes should have a forward voltage of less than 0.4V, and be connected with cathode to the output and anode to ground.

PACKAGE

Chip Only
16 Lead SOIC

SUFFIX

-C
-SOP



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