

3.3V Dual LVTTTL-to-Differential LVPECL Translator

Features

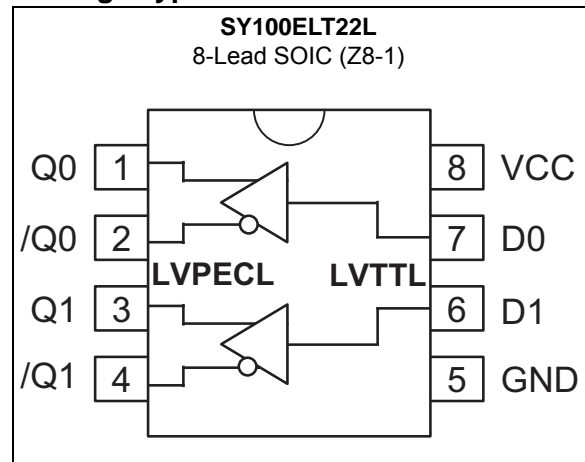
- 3.3V Power Supply
- 300 ps Typical Propagation Delay
- <100 ps Output-to-Output Skew
- Differential LVPECL Outputs
- PNP LVTTTL Inputs for Minimal Loading
- Flow-Through Pinouts
- Available in 8-Lead SOIC Package

General Description

The SY100ELT22L is a dual LVTTTL-to-differential LVPECL translator with +3.3V power supply. Because LVPECL levels are used, only +3.3V and ground are required. The small-outline 8-lead SOIC package and the low skew, dual gate design of the ELT22L make it ideal for applications that require the translation of a clock and a data signal.

The SY100ELT22L is compatible with positive ECL 100K logic levels.

Package Type



SY100ELT22L

1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings †

| | |
|------------------------------------|-------------------|
| Supply Voltage (V_{CC}) | –0.5V to +7.0V |
| LVTTL Input Voltage (V_{IN}) | –0.5V to V_{CC} |
| LVTTL Input Current (I_{IN}) | –30 mA to +5.0 mA |
| LVPECL Output Current (Continuous) | 50 mA |
| LVPECL Output Current (Surge) | 100 mA |

† **Notice:** Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational sections of this specification is not intended. Exposure to maximum rating conditions for extended periods may affect device reliability.

TABLE 1-1: DC ELECTRICAL CHARACTERISTICS

Electrical Characteristics: $V_{CC} = +3.0V$ to $+3.8V$, $T_A = -40^{\circ}C$ to $+85^{\circ}C$, unless noted.

| Parameter | Symbol | Min. | Typ. | Max. | Units | Conditions |
|----------------------|----------|------|------|------|-------|------------|
| Power Supply Current | I_{CC} | — | — | 25 | mA | — |

TABLE 1-2: LVTTL DC ELECTRICAL CHARACTERISTICS

Electrical Characteristics: $V_{CC} = +3.0V$ to $+3.8V$, $T_A = -40^{\circ}C$ to $+85^{\circ}C$ unless noted.

| Parameter | Symbol | Min. | Typ. | Max. | Units | Conditions |
|---------------------|----------|------|------|------|---------|-------------------|
| Input High Voltage | V_{IH} | 2.0 | — | — | V | — |
| Input Low Voltage | V_{IL} | — | — | 0.8 | V | — |
| Input High Current | I_{IH} | — | — | 20 | μA | $V_{IN} = 2.7V$ |
| | | — | — | 100 | | $V_{IN} = V_{CC}$ |
| Input Low Current | I_{IL} | — | — | –0.2 | mA | $V_{IN} = 0.5V$ |
| Input Clamp Voltage | V_{IK} | — | — | –1.2 | V | $I_{IN} = -18$ mA |

TABLE 1-3: LVPECL DC ELECTRICAL CHARACTERISTICS

Electrical Characteristics: $V_{CC} = +3.0V$ to $+3.8V$.

| Parameter | Symbol | Min. | Typ. | Max. | Units | Conditions |
|---------------------|----------|------|------|------|-------|---|
| Output High Voltage | V_{OH} | 2220 | — | 2420 | mV | $T_A = -40^{\circ}C$, Note 1 . |
| | | 2275 | — | 2420 | | $T_A = 0^{\circ}C$ to $+85^{\circ}C$, Note 1 . |
| Output Low Voltage | V_{OL} | 1470 | — | 1750 | mV | $T_A = -40^{\circ}C$, Note 1 . |
| | | 1490 | — | 1680 | | $T_A = 0^{\circ}C$ to $+85^{\circ}C$, Note 1 . |

Note 1: Values are for $V_{CC} = 3.3V$. Level specifications will vary 1:1 with V_{CC} .

TABLE 1-4: AC ELECTRICAL CHARACTERISTICS

Electrical Characteristics: $V_{CC} = +3.0V$ to $+3.8V$; $T_A = -40^{\circ}C$ to $+85^{\circ}C$, unless otherwise stated.

| Parameter | Symbol | Min. | Typ. | Max. | Units | Conditions |
|---|------------|------|------|------|-------|-------------------------------|
| Propagation Delay to Output | t_{PD} | 100 | — | 600 | ps | 50Ω to $V_{CC} - 2.0V$ |
| Output Rise/Fall Time, 20% to 80% | t_r/t_f | 200 | — | 500 | ps | 50Ω to $V_{CC} - 2.0V$ |
| Part-to-Part Skew, Note 1 | t_{SKPP} | — | — | 500 | ps | 50Ω to $V_{CC} - 2.0V$ |
| Within-Device Skew, Note 1 , Note 2 | t_{SKEW} | — | — | 100 | ps | 50Ω to $V_{CC} - 2.0V$ |

Note 1: Guaranteed, but not tested.

2: Same transition at common V_{CC} levels.

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TEMPERATURE SPECIFICATIONS (Note 1)

| Parameters | Sym. | Min. | Typ. | Max. | Units | Conditions |
|-----------------------------|-------|------|------|------|-------|----------------|
| Temperature Ranges | | | | | | |
| Operating Temperature Range | T_A | -40 | — | +85 | °C | — |
| Storage Temperature Range | T_S | -65 | — | +150 | °C | — |
| Lead Temperature | — | — | — | +260 | °C | Soldering, 20s |

Note 1: The maximum allowable power dissipation is a function of ambient temperature, the maximum allowable junction temperature and the thermal resistance from junction to air (i.e., T_A , T_J , θ_{JA}). Exceeding the maximum allowable power dissipation will cause the device operating junction temperature to exceed the maximum +85°C rating. Sustained junction temperatures above +125°C can impact the device reliability.

2.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in [Table 2-1](#).

TABLE 2-1: PIN FUNCTION TABLE

| Pin Number | Pin Name | Description |
|------------|--------------------|------------------------------|
| 1, 2, 3, 4 | Q0, /Q0 Q1, /Q1 | Differential LVPECL Outputs. |
| 5 | GND | Ground. |
| 6, 7 | D1, D0 | LVTTL Inputs |
| 8 | VCC | +3.3V Supply |

2.1 Truth Table

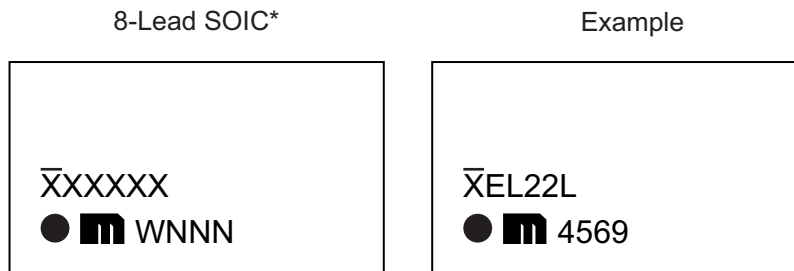
TABLE 2-2: TRUTH TABLE

| D | Q | \bar{Q} |
|------|---|-----------|
| H | H | L |
| L | L | H |
| Open | H | L |

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3.0 PACKAGING INFORMATION

3.1 Package Marking Information



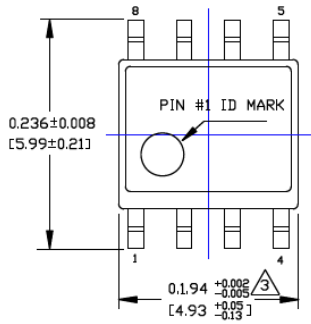
| |
|--|
| <p>Legend: XX...X Product code or customer-specific information Y Year code (last digit of calendar year) YY Year code (last 2 digits of calendar year) WW Week code (week of January 1 is week '01') NNN Alphanumeric traceability code ⓔ3 Pb-free JEDEC® designator for Matte Tin (Sn) * This package is Pb-free. The Pb-free JEDEC designator (ⓔ3) can be found on the outer packaging for this package.</p> <p>●, ▲, ▼ Pin one index is identified by a dot, delta up, or delta down (triangle mark).</p> |
| <p>Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information. Package may or may not include the corporate logo.</p> <p>Underbar (¯) and/or Overbar (¯) symbol may not be to scale.</p> |

8-Lead SOIC Package Outline and Recommended Land Pattern

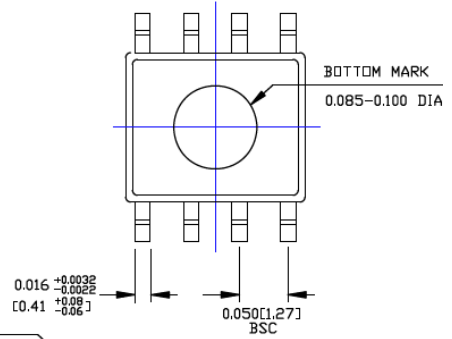
TITLE

8 LEAD SOICN PACKAGE OUTLINE & RECOMMENDED LAND PATTERN

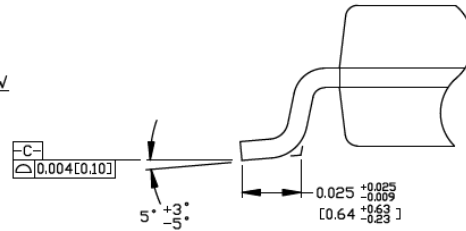
| | | | |
|------------------|----------------|-------------|-----------|
| DRAWING # | SOICN-8LD-PL-1 | UNIT | INCH [MM] |
|------------------|----------------|-------------|-----------|



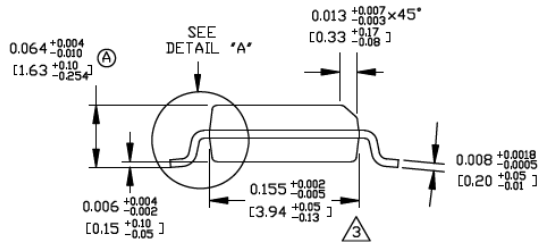
TOP VIEW



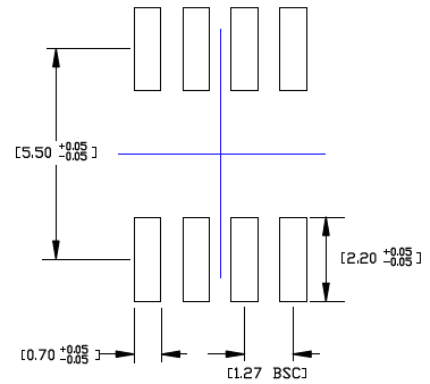
BOTTOM VIEW



DETAIL "A"



END VIEW



RECOMMENDED LAND PATTERN

NOTES:

1. DIMENSIONS ARE IN INCHES[MM].
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.010[0.25] PER SIDE.

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>.

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NOTES:

APPENDIX A: REVISION HISTORY

Revision A (January 2018)

- Converted Micrel document SY100ELT22L to Microchip data sheet DS20005931A.
- Minor text changes throughout.

SY100ELT22L

NOTES:

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, contact your local Microchip representative or sales office.

| <u>PART NO.</u> | X | X | X | -XX |
|---|---------------------------------|---------------------------------|---|--|
| Device | Supply Voltage | Package | Temperature Range | Special Processing |
| Device: SY100ELT22: 3.3V Dual LVTTTL-to-Differential LVPECL Translator | Supply Voltage: L = 3.3V | Package: Z = 8-Lead SOIC | Temperature Range: G = -40°C to +85°C (Pb-Free NiPdAu) | Special Processing: <blank>= 95/Tube TR = 1,000/Reel |

Examples:

a) SY100ELT22LZG: SY100ELT22, 3.3V, 8-Lead SOIC, -40°C to +85°C (Pb-Free NiPdAu), 95/Tube

b) SY100ELT22LZG-TR: SY100ELT22, 3.3V, 8-Lead SOIC, -40°C to +85°C (Pb-Free NiPdAu), 1,000/Reel

Note 1: Tape and Reel identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with the Tape and Reel option.

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NOTES:

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