ARIZONA MICROTEK, INC.

# AZ10ELT22
# AZ100ELT22

## CMOS/TTL to Differential PECL Translator

## FEATURES

- Green / RoHS Compliant / Lead (Pb) Free package available
- 0.5ns Typical Propagation Delay
- <100ps Typical Output to Output Skew
- Differential PECL Outputs
- Flow Through Pinouts
- Operating Range of 3.0V to 5.5V
- Direct Replacement for ON Semiconductor MC10ELT22 & MC100ELT22
- IBIS Model Files Available on Arizona Microtek Website

**PACKAGE AVAILABILITY**

| PACKAGE | PART NUMBER | MARKING | NOTES |
|---|---|---|---|
| SOIC 8 | AZ10ELT22D | AZM10<br>ELT22 | 1,2,4 |
| SOIC 8 RoHS Compliant / Lead (Pb) Free | AZ10ELT22D+ | AZM10+<br>ELT22 | 1,2,4 |
| SOIC 8 | AZ100ELT22D | AZM100<br>ELT22 | 1,2,4 |
| SOIC 8 RoHS Compliant / Lead (Pb) Free | AZ100ELT22D+ | AZM100+<br>ELT22 | 1,2,4 |
| TSSOP 8 | AZ10ELT22T | AZT<br>LT22 | 1,2,4 |
| TSSOP 8 RoHS Compliant / Lead (Pb) Free | AZ10ELT22T+ | AZT+<br>LT22 | 1,2,4 |
| TSSOP 8 | AZ100ELT22T | AZH<br>LT22 | 1,2,4 |
| TSSOP 8 RoHS Compliant / Lead (Pb) Free | AZ100ELT22T+ | AZH+<br>LT22 | 1,2,4 |

1 Add R1 at end of part number for 7 inch (1K parts), R2 for 13 inch (2.5K parts) Tape & Reel.
2 Date code format: "Y" or "YY" for year followed by "WW" for week.
3 Parts marked JNB for date codes prior to 4WW (prior to 2004).
4 Date code "YWW" or "YYWW" on underside of part.

## DESCRIPTION

The AZ10/100ELT22 is a dual CMOS/TTL to differential PECL translator. Because PECL (Positive ECL) levels are used, only $V_{CC}$ and ground are required. The small outline packaging and the low skew, dual gate design of the ELT22 makes it ideal for applications that require the translation of a clock and a data signal.

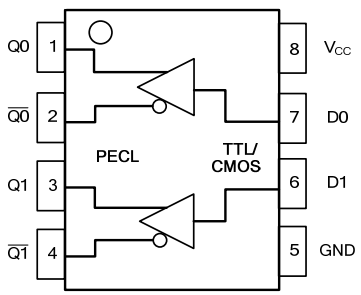
The ELT22 is available in both PECL standards: the 10ELT is compatible with PECL 10K logic levels while the 100ELT is compatible with PECL 100K logic levels.

NOTE: Specifications in PECL tables are valid when thermal equilibrium is established.

**PIN DESCRIPTION**

| PIN | FUNCTION |
|---|---|
| Q0, $\overline{Q0}$, Q1, $\overline{Q1}$ | Differential PECL Outputs |
| D0, D1 | CMOS/TTL Input |
| $V_{CC}$ | Positive Supply |
| GND | Ground |

**LOGIC DIAGRAM AND PINOUT**



**Absolute Maximum Ratings are those values beyond which device life may be impaired.**

| Symbol | Characteristic | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage (Referenced to GND) | | 8.0 | V |
| $V_{IN}$ | Input Voltage | | 0 to 6.0 | V |
| $I_{OUT}$ | Current Applied to Output in Low Output State | ---Continuous<br>---Surge | 50<br>100 | mA |
| $T_A$ | Operating Temperature Range (In Free-Air) | | -40 to +85 | °C |
| $T_{STG}$ | Storage Temperature Range | | -65 to +150 | °C |

**TTL/CMOS INPUT DC CHARACTERISTICS** (GND = 0.0V, $V_{CC}$ = +3.0V to +5.5V)

| Symbol | Characteristic | Min | Typ | Max | Unit | Condition |
|---|---|---|---|---|---|---|
| $I_{IH}$ | Input HIGH Current | | | 15 | µA | $V_{IN}$ = 2.7V |
| $I_{IH}$ | Input HIGH Current | | | 20 | µA | $V_{IN}$ = $V_{CC}$ |
| $I_{IL}$ | Input LOW Current | | | -0.1 | mA | $V_{IN}$ = 0.5V |
| $V_{IK}$ | Input Clamp Diode Voltage | | | -1.2 | V | $I_{IN}$ = -18mA |
| $V_{IH}$ | Input HIGH Voltage | 2.0 | | | V | |
| $V_{IL}$ | Input LOW Voltage | | | 0.8 | V | |

**10K LVPECL DC Characteristics** GND = 0.0V, $V_{CC}$ = +3.3V)

| Symbol | Characteristic | -40°C | | | 0°C | | | 25°C | | | 85°C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| $V_{OH}$ | Output HIGH Voltage[1,2] | 2170 | | 2410 | 2245 | | 2460 | 2295 | 2400 | 2490 | 2390 | | 2580 | mV |
| $V_{OL}$ | Output LOW Voltage[1,2] | 1350 | | 1685 | 1350 | | 1670 | 1350 | 1550 | 1670 | 1350 | | 1705 | mV |
| $I_{CC}$ | Power Supply Current[3] | | | 24 | | | 24 | | | 24 | | | 25 | mA |

1. Output parameters vary 1:1 with $V_{CC}$.
2. Each output is terminated through a 50Ω resistor to $V_{CC}$ – 2V.
3. $I_{CC}$ is measured with outputs open.

**10K PECL DC Characteristics** (GND = 0.0V, $V_{CC}$ = +5.0V)

| Symbol | Characteristic | -40°C | | | 0°C | | | 25°C | | | 85°C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| $V_{OH}$ | Output HIGH Voltage[1,2] | 3870 | | 4110 | 3945 | | 4160 | 3995 | 4100 | 4190 | 4090 | | 4280 | mV |
| $V_{OL}$ | Output LOW Voltage[1,2] | 3050 | | 3385 | 3050 | | 3370 | 3050 | 3250 | 3370 | 3050 | | 3405 | mV |
| $I_{CC}$ | Power Supply Current[3] | | | 24 | | | 24 | | | 24 | | | 25 | mA |

1. Output parameters vary 1:1 with $V_{CC}$.
2. Each output is terminated through a 50Ω resistor to $V_{CC}$ – 2V.
3. $I_{CC}$ is measured with outputs open.

**100K LVPECL DC Characteristics** (GND = 0.0V, $V_{CC}$ = +3.3V)

| Symbol | Characteristic | -40°C | | | 0°C | | | 25°C | | | 85°C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| $V_{OH}$ | Output HIGH Voltage[1,2] | 2160 | | 2420 | 2205 | | 2420 | 2235 | 2345 | 2420 | 2255 | | 2420 | mV |
| $V_{OL}$ | Output LOW Voltage[1,2] | 1470 | | 1745 | 1490 | | 1680 | 1490 | 1595 | 1680 | 1490 | | 1680 | mV |
| $I_{CC}$ | Power Supply Current[3] | | | 24 | | | 24 | | | 24 | | | 25 | mA |

1. Output parameters vary 1:1 with $V_{CC}$.
2. Each output is terminated through a 50Ω resistor to $V_{CC}$ – 2V.
3. $I_{CC}$ is measured with outputs open.

**100K PECL DC Characteristics** (GND = 0.0V, $V_{CC}$ = +5.0V)

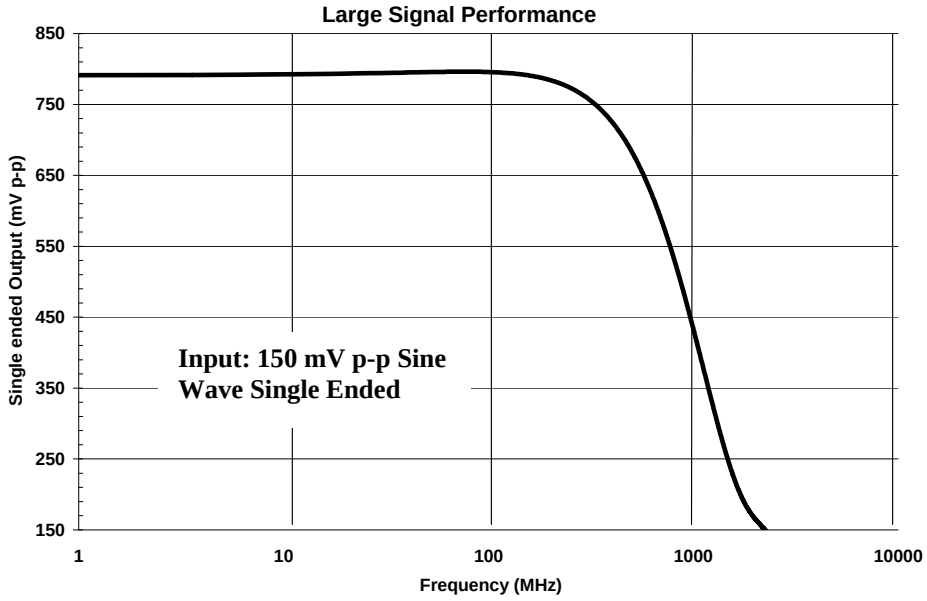
| Symbol | Characteristic | -40°C | | | 0°C | | | 25°C | | | 85°C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | |
| $V_{OH}$ | Output HIGH Voltage[1,2] | 3860 | | 4120 | 3905 | | 4120 | 3935 | 4045 | 4120 | 3955 | | 4120 | mV |
| $V_{OL}$ | Output LOW Voltage[1,2] | 3170 | | 3445 | 3190 | | 3380 | 3190 | 3295 | 3380 | 3190 | | 3380 | mV |
| $I_{CC}$ | Power Supply Current[3] | | | 24 | | | 24 | | | 24 | | | 25 | mA |

1. Output parameters vary 1:1 with $V_{CC}$.
2. Each output is terminated through a 50Ω resistor to $V_{CC}$ – 2V.
3. $I_{CC}$ is measured with outputs open.

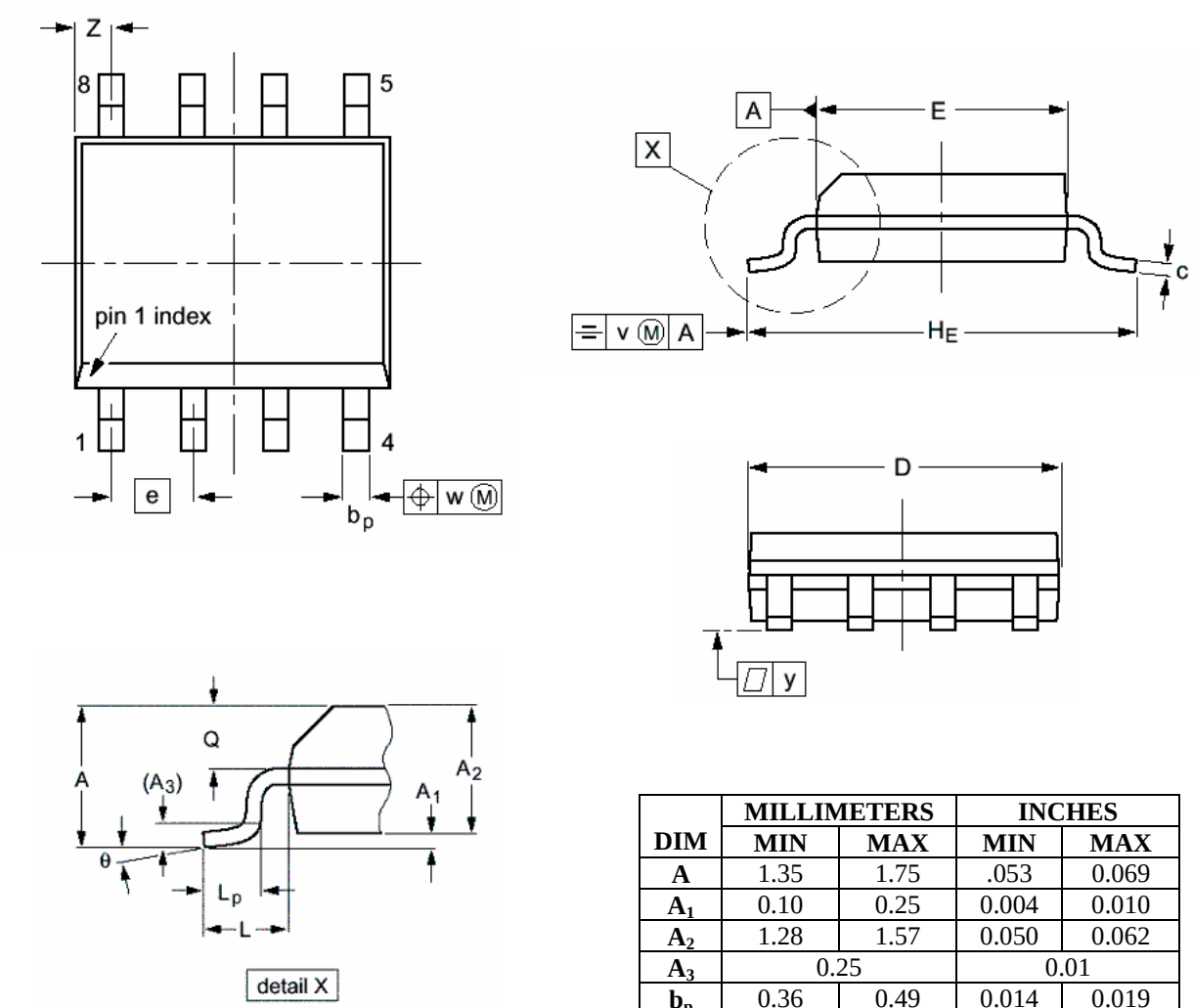
**AC Characteristics** (GND = 0.0V, $V_{CC}$ = +3.0V to +5.5V)

| Symbol | Characteristic | -40°C | | 0°C | | 25°C | | | 85°C | | Unit | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Max | Min | Max | Min | Typ | Max | Min | Max | | |
| $t_{PLH}$ | Propagation Delay[1] | 0.2 | 0.7 | 0.2 | 0.7 | 0.2 | 0.4 | 0.7 | 0.2 | 0.7 | ns | |
| $t_{PHL}$ | Propagation Delay[1] | 0.2 | 0.7 | 0.2 | 0.7 | 0.2 | 0.4 | 0.7 | 0.2 | 0.7 | ns | |
| $t_r/t_f$ | Output Rise/Fall Time | 0.25 | 0.7 | 0.25 | 0.7 | 0.25 | | 0.7 | 0.25 | 0.7 | ns | 20-80% |
| $f_{MAX}$ | Maximum Frequency[2] | 350 | | 350 | | 350 | | | 350 | | MHz | |
| $f_{MAX}$ | Maximum Frequency[3] | 670 | | 800 | | 800 | | | 800 | | MHz | |

1. Propagation delay is measured from +1.5V on the input to 50% of the PECL output swing. Input rise/fall times are < 1ns/V.
2. Full swing PECL output.
3. Output at –3 dB.



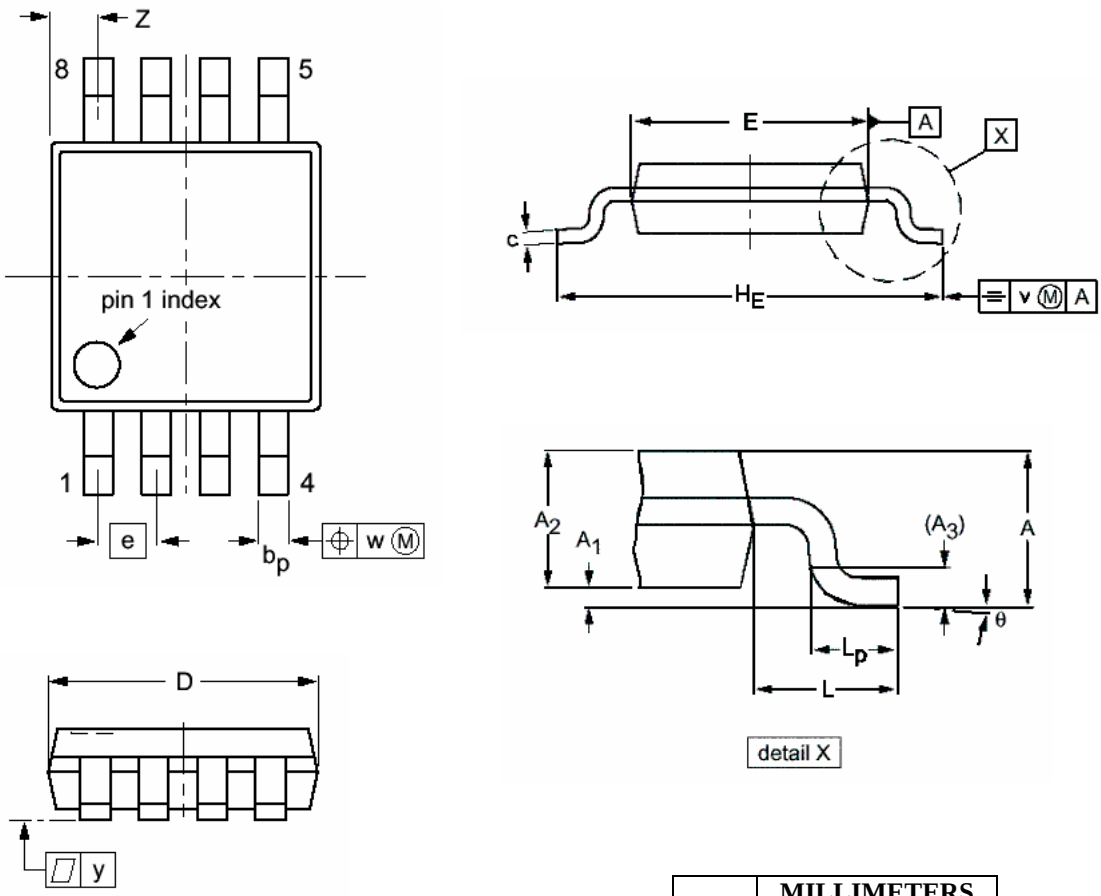
## PACKAGE DIAGRAM
## SOIC 8




NOTES:
1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

| DIM | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| **A** | 1.35 | 1.75 | .053 | 0.069 |
| **$A_1$** | 0.10 | 0.25 | 0.004 | 0.010 |
| **$A_2$** | 1.28 | 1.57 | 0.050 | 0.062 |
| **$A_3$** | 0.25 | | 0.01 | |
| **$b_p$** | 0.36 | 0.49 | 0.014 | 0.019 |
| **c** | 0.19 | 0.25 | 0.0075 | 0.0100 |
| **D** | 4.80 | 5.00 | 0.19 | 0.20 |
| **E** | 3.80 | 4.00 | 0.15 | 0.16 |
| **e** | 1.27 | | 0.050 | |
| **$H_E$** | 5.80 | 6.20 | 0.228 | 0.244 |
| **L** | 1.05 | | 0.041 | |
| **$L_p$** | 0.40 | 1.27 | 0.016 | 0.050 |
| **Q** | 0.60 | 0.70 | 0.024 | 0.028 |
| **v** | 0.25 | | 0.01 | |
| **w** | 0.25 | | 0.01 | |
| **y** | 0.10 | | 0.004 | |
| **Z** | 0.30 | 0.70 | 0.012 | 0.028 |
| **θ** | $0^O$ | $8^O$ | $0^O$ | $8^O$ |

## PACKAGE DIAGRAM
## TSSOP 8




NOTES:
1. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
2. MAXIMUM MOLD PROTRUSION FOR D IS 0.15mm.
3. MAXIMUM MOLD PROTRUSION FOR E IS 0.25mm.

| DIM | MILLIMETERS MIN | MAX |
|---|---|---|
| **A** | | 1.10 |
| **$A_1$** | 0.05 | 0.15 |
| **$A_2$** | 0.75 | 0.95 |
| **$A_3$** | 0.25 | |
| **$b_p$** | 0.22 | 0.40 |
| **c** | 0.13 | 0.23 |
| **D** | 2.90 | 3.10 |
| **E** | 2.90 | 3.10 |
| **e** | 0.65 | |
| **$H_E$** | 4.75 | 5.05 |
| **L** | 0.95 | |
| **$L_p$** | 0.40 | 0.70 |
| **v** | 0.10 | |
| **w** | 0.08 | |
| **y** | 0.10 | |
| **Z** | 0.38 | 0.64 |
| **θ** | $0^O$ | $6^O$ |