

# AZ10EL01 AZ100EL01

## ECL/PECL 4-Input OR/NOR

### FEATURES

- 230ps Propagation Delay
- High Bandwidth Output Transitions
- 75kΩ Internal Input Pulldown Resistors
- Direct Replacement for ON Semiconductor MC10EL01 & MC100EL01

### PACKAGE AVAILABILITY

| PACKAGE     | PART NO.     | MARKING    |
|-------------|--------------|------------|
| SOIC 8      | AZ10EL01D    | AZM10EL01  |
| SOIC 8 T&R  | AZ10EL01DR1  | AZM10EL01  |
| SOIC 8 T&R  | AZ10EL01DR2  | AZM10EL01  |
| SOIC 8      | AZ100EL01D   | AZM100EL01 |
| SOIC 8 T&R  | AZ100EL01DR1 | AZM100EL01 |
| SOIC 8 T&R  | AZ100EL01DR2 | AZM100EL01 |
| TSSOP 8     | AZ10EL01T    | AZTEL01    |
| TSSOP 8 T&R | AZ10EL01TR1  | AZTEL01    |
| TSSOP 8 T&R | AZ10EL01TR2  | AZTEL01    |
| TSSOP 8     | AZ100EL01T   | AZHEL01    |
| TSSOP 8 T&R | AZ100EL01TR1 | AZHEL01    |
| TSSOP 8 T&R | AZ100EL01TR2 | AZHEL01    |

### DESCRIPTION

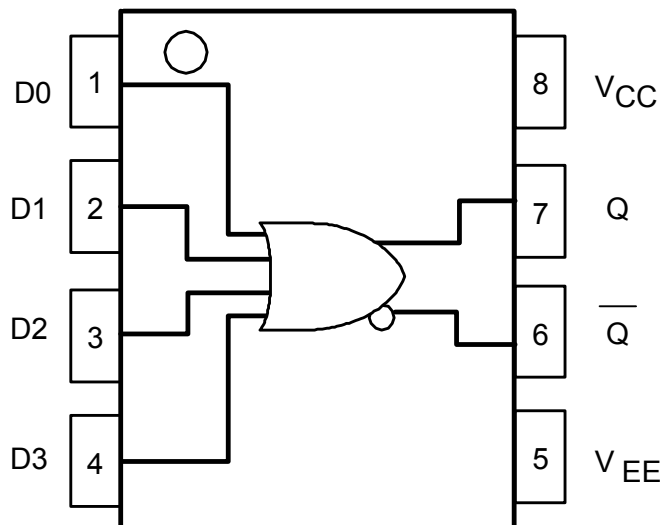
The AZ10/100EL01 is a 4-input OR/NOR gate. The device is functionally equivalent to the E101 device with higher performance capabilities. With propagation delays and output transition times significantly faster than the E101, the EL01 is ideally suited for those applications that require the ultimate in AC performance.

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

### LOGIC DIAGRAM AND PINOUT ASSIGNMENT

#### PIN DESCRIPTION

| PIN             | FUNCTION        |
|-----------------|-----------------|
| D0 - D3         | Data Inputs     |
| Q, $\bar{Q}$    | Data Outputs    |
| V <sub>CC</sub> | Positive Supply |
| V <sub>EE</sub> | Negative Supply |



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

| Symbol           | Characteristic                                | Rating      | Unit |
|------------------|---|-------------|------|
| V <sub>CC</sub>  | PECL Power Supply (V <sub>EE</sub> = 0V)      | 0 to +8.0   | Vdc  |
| V <sub>I</sub>   | PECL Input Voltage (V <sub>EE</sub> = 0V)     | 0 to +6.0   | Vdc  |
| V <sub>EE</sub>  | ECL Power Supply (V <sub>CC</sub> = 0V)       | -8.0 to 0   | Vdc  |
| V <sub>I</sub>   | ECL Input Voltage (V <sub>CC</sub> = 0V)      | -6.0 to 0   | Vdc  |
| I <sub>OUT</sub> | Output Current<br>--- Continuous<br>--- Surge | 50<br>100   | mA   |
| T <sub>A</sub>   | Operating Temperature Range                   | -40 to +85  | °C   |
| T <sub>STG</sub> | Storage Temperature Range                     | -65 to +150 | °C   |

**10K ECL DC Characteristics (V<sub>EE</sub> = -4.75V to -5.5V, V<sub>CC</sub> = GND)**

| Symbol          | Characteristic                   | -40°C |     |       | 0°C   |     |       | 25°C  |     |       | 85°C  |     |       | Unit |
|-----------------|----------------------------------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|------|
|                 |                                  | Min   | Typ | Max   | Min   | Typ | Max   | Min   | Typ | Max   | Min   | Typ | Max   |      |
| V <sub>OH</sub> | Output HIGH Voltage <sup>1</sup> | -1080 |     | -890  | -1020 |     | -840  | -980  |     | -810  | -910  |     | -720  | mV   |
| V <sub>OL</sub> | Output LOW Voltage <sup>1</sup>  | -1950 |     | -1650 | -1950 |     | -1630 | -1950 |     | -1630 | -1950 |     | -1595 | mV   |
| V <sub>IH</sub> | Input HIGH Voltage               | -1230 |     | -890  | -1170 |     | -840  | -1130 |     | -810  | -1060 |     | -720  | mV   |
| V <sub>IL</sub> | Input LOW Voltage                | -1950 |     | -1500 | -1950 |     | -1480 | -1950 |     | -1480 | -1950 |     | -1445 | mV   |
| I <sub>IH</sub> | Input HIGH Current               |       |     | 150   |       |     | 150   |       |     | 150   |       |     | 150   | µA   |
| I <sub>IL</sub> | Input LOW Current                | 0.5   |     |       | 0.5   |     |       | 0.5   |     |       | 0.5   |     |       | µA   |
| I <sub>EE</sub> | Power Supply Current             |       | 14  | 17    |       | 14  | 17    |       | 14  | 17    |       | 14  | 17    | mA   |

- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

**10K PECL DC Characteristics (V<sub>EE</sub> = GND, V<sub>CC</sub> = +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 <sub>OH</sub> | Output HIGH Voltage <sup>1,2</sup> | 3920  |     | 4110 | 3980 |     | 4160 | 4020 |     | 4190 | 4090 |     | 4280 | mV   |
| V <sub>OL</sub> | Output LOW Voltage <sup>1,2</sup>  | 3050  |     | 3350 | 3050 |     | 3370 | 3050 |     | 3370 | 3050 |     | 3405 | mV   |
| V <sub>IH</sub> | Input HIGH Voltage <sup>1</sup>    | 3770  |     | 4110 | 3830 |     | 4160 | 3870 |     | 4190 | 3940 |     | 4280 | mV   |
| V <sub>IL</sub> | Input LOW Voltage <sup>1</sup>     | 3050  |     | 3500 | 3050 |     | 3520 | 3050 |     | 3520 | 3050 |     | 3555 | mV   |
| I <sub>IH</sub> | Input HIGH Current                 |       |     | 150  |      |     | 150  |      |     | 150  |      |     | 150  | µA   |
| I <sub>IL</sub> | Input LOW Current                  | 0.5   |     |      | 0.5  |     |      | 0.5  |     |      | 0.5  |     |      | µA   |
| I <sub>EE</sub> | Power Supply Current               |       | 14  | 17   |      | 14  | 17   |      | 14  | 17   |      | 14  | 17   | mA   |

- For supply voltages other than 5.0V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

**100K ECL DC Characteristics (V<sub>EE</sub> = -4.2V to -5.5V, V<sub>CC</sub> = GND)**

| Symbol          | Characteristic                   | -40°C |       |       | 0°C   |       |       | 25°C  |       |       | 85°C  |       |       | Unit |
|-----------------|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
|                 |                                  | Min   | Typ   | Max   | Min   | Typ   | Max   | Min   | Typ   | Max   | Min   | Typ   | Max   |      |
| V <sub>OH</sub> | Output HIGH Voltage <sup>1</sup> | -1085 | -1005 | -880  | -1025 | -955  | -880  | -1025 | -955  | -880  | -1025 | -955  | -880  | mV   |
| V <sub>OL</sub> | Output LOW Voltage <sup>1</sup>  | -1830 | -1695 | -1555 | -1810 | -1705 | -1620 | -1810 | -1705 | -1620 | -1810 | -1705 | -1620 | mV   |
| V <sub>IH</sub> | Input HIGH Voltage               | -1165 |       | -880  | -1165 |       | -880  | -1165 |       | -880  | -1165 |       | -880  | mV   |
| V <sub>IL</sub> | Input LOW Voltage                | -1810 |       | -1475 | -1810 |       | -1475 | -1810 |       | -1475 | -1810 |       | -1475 | mV   |
| I <sub>IH</sub> | Input HIGH Current               |       |       | 150   |       |       | 150   |       |       | 150   |       |       | 150   | µA   |
| I <sub>IL</sub> | Input LOW Current                | 0.5   |       |       | 0.5   |       |       | 0.5   |       |       | 0.5   |       |       | µA   |
| I <sub>EE</sub> | Power Supply Current             |       | 14    | 17    |       | 14    | 17    |       | 14    | 17    |       | 16    | 20    | mA   |

- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

**100K PECL DC Characteristics (V<sub>EE</sub> = GND, V<sub>CC</sub> = +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 <sub>OH</sub> | Output HIGH Voltage <sup>1,2</sup> | 3915  | 3995 | 4120 | 3975 | 4045 | 4120 | 3975 | 4045 | 4120 | 3975 | 4045 | 4120 | mV   |
| V <sub>OL</sub> | Output LOW Voltage <sup>1,2</sup>  | 3170  | 3305 | 3445 | 3190 | 3295 | 3380 | 3190 | 3295 | 3380 | 3190 | 3295 | 3380 | mV   |
| V <sub>IH</sub> | Input HIGH Voltage <sup>1</sup>    | 3835  |      | 4120 | 3835 |      | 4120 | 3835 |      | 4120 | 3835 |      | 4120 | mV   |
| V <sub>IL</sub> | Input LOW Voltage <sup>1</sup>     | 3190  |      | 3525 | 3190 |      | 3525 | 3190 |      | 3525 | 3190 |      | 3525 | mV   |
| V <sub>BB</sub> | Reference Voltage <sup>1</sup>     | 3620  |      | 3740 | 3620 |      | 3740 | 3620 |      | 3740 | 3620 |      | 3740 | mV   |
| I <sub>IH</sub> | Input HIGH Current                 |       |      | 150  |      |      | 150  |      |      | 150  |      |      | 150  | µA   |
| I <sub>IL</sub> | Input LOW Current                  | 0.5   |      |      | 0.5  |      |      | 0.5  |      |      | 0.5  |      |      | µA   |
| I <sub>EE</sub> | Power Supply Current               |       | 14   | 17   |      | 14   | 17   |      | 14   | 17   |      | 16   | 20   | mA   |

- For supply voltages other than 5.0V, use the ECL table values and ADD supply voltage value.
- Each output is terminated through a 50Ω resistor to V<sub>CC</sub> - 2V.

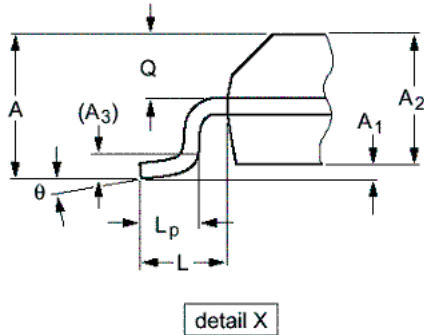
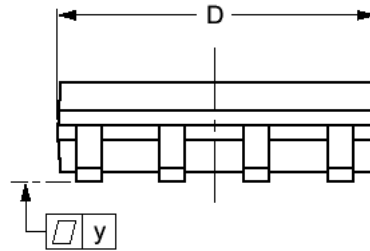
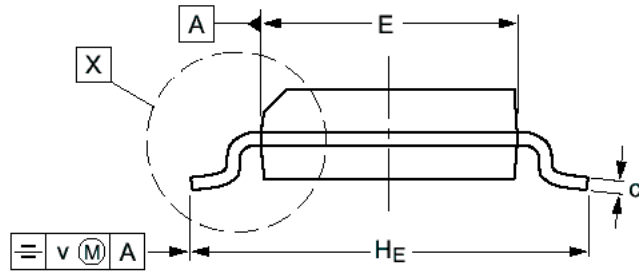
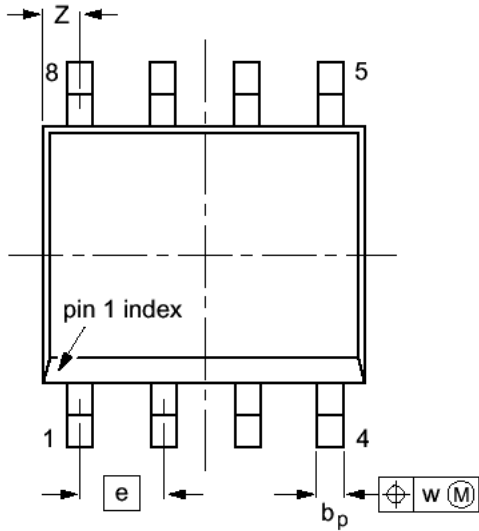
**AZ10EL01**  
**AZ100EL01**

**AC Characteristics** ( $V_{EE} = 10E(-4.75V \text{ to } -5.5V)$ ,  $100E(-4.2V \text{ to } -5.5V)$ ;  $V_{CC} = GND$  or  $V_{EE} = GND$ ,  $V_{CC} = 10E(+4.75V \text{ to } +5.5V)$ ,  $100E(+4.2V \text{ to } +5.5V)$ )

| Symbol              | Characteristic              | -40°C |     |     | 0°C |     |     | 25°C |     |     | 85°C |     |     | Unit |
|---------------------|-----------------------------|-------|-----|-----|-----|-----|-----|------|-----|-----|------|-----|-----|------|
|                     |                             | Min   | Typ | Max | Min | Typ | Max | Min  | Typ | Max | Min  | Typ | Max |      |
| $t_{PLH} / t_{PHL}$ | Propagation Delay to Output | 70    | 220 | 370 | 120 | 220 | 320 | 130  | 230 | 330 | 150  | 250 | 350 | ps   |
| $t_r / t_f$         | Rise/Fall Time<br>20 – 80%  | 100   |     | 350 | 100 |     | 350 | 100  |     | 350 | 100  |     | 350 | ps   |

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**PACKAGE DIAGRAM  
SOIC 8**



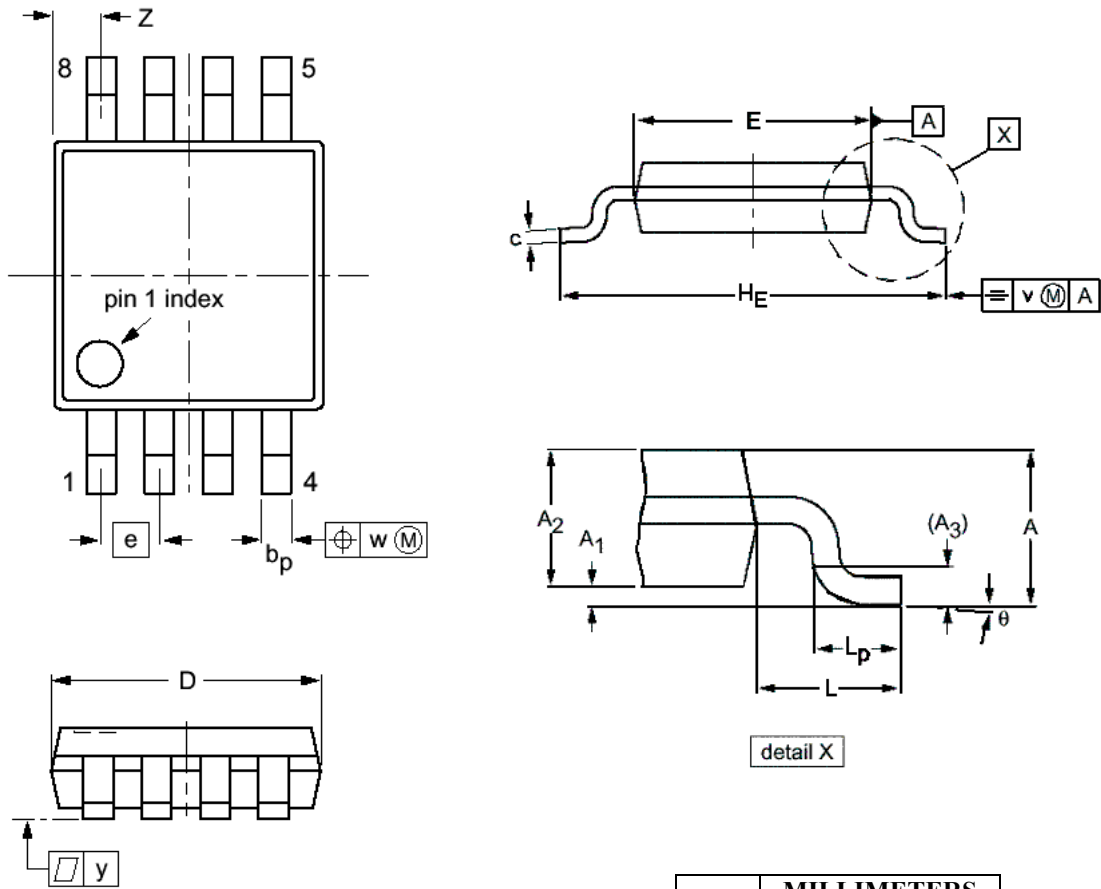
| DIM            | MILLIMETERS |      | INCHES |        |
|----------------|-------------|------|--------|--------|
|                | MIN         | MAX  | MIN    | MAX    |
| A              |             | 1.75 |        | 0.069  |
| A <sub>1</sub> | 0.10        | 0.25 | 0.004  | 0.010  |
| A <sub>2</sub> | 1.25        | 1.45 | 0.049  | 0.057  |
| A <sub>3</sub> | 0.25        |      | 0.01   |        |
| b <sub>p</sub> | 0.36        | 0.49 | 0.014  | 0.019  |
| c              | 0.19        | 0.25 | 0.0075 | 0.0100 |
| D              | 4.8         | 5.0  | 0.19   | 0.20   |
| E              | 3.8         | 4.0  | 0.15   | 0.16   |
| e              | 1.27        |      | 0.050  |        |
| H <sub>E</sub> | 5.80        | 6.20 | 0.228  | 0.244  |
| L              | 1.05        |      | 0.041  |        |
| L <sub>p</sub> | 0.40        | 1.00 | 0.016  | 0.039  |
| 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°          | 8°   | 0°     | 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.

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**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 <sub>1</sub> | 0.05        | 0.15 |
| A <sub>2</sub> | 0.80        | 0.95 |
| A <sub>3</sub> | 0.25        |      |
| b <sub>p</sub> | 0.25        | 0.45 |
| c              | 0.15        | 0.28 |
| D              | 2.90        | 3.10 |
| E              | 2.90        | 3.10 |
| e              | 0.65        |      |
| H <sub>E</sub> | 4.70        | 5.10 |
| L              | 0.94        |      |
| L <sub>p</sub> | 0.40        | 0.70 |
| v              | 0.10        |      |
| w              | 0.10        |      |
| y              | 0.10        |      |
| Z              | 0.35        | 0.70 |
| θ              | 0°          | 6°   |

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