# 5V/3.3V 4-INPUT OR/NOR



## FEATURES

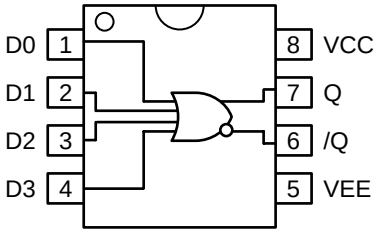
- 3.3V and 5V power supply options
- 230ps typical propagation delay
- High bandwidth to 3GHz
- 75kΩ internal input pulldown resistors
- Q output will default LOW with inputs open
- Available in 8-pin MSOP and SOIC packages

ECL Pro™

## DESCRIPTION

The SY10EP01V is a 4-input OR/NOR gate. The device is functionally equivalent to the EL01 device, E101 (a quad version). The SY10EP01V is ideal for applications requiring the fastest AC performance available.

## PIN CONFIGURATION/BLOCK DIAGRAM




**Available in 8-Pin SOIC and MSOP Packages**

## PIN NAMES

| Pin | Function |
|---|---|
| $D_0$–$D_3$ | ECL Data Inputs |
| Q, /Q | ECL Data Outputs |

## TRUTH TABLE

| $D_0$ | $D_1$ | $D_2$ | $D_3$ | Q | /Q |
|---|---|---|---|---|---|
| L | L | L | L | L | H |
| H | X | X | X | H | L |
| X | H | X | X | H | L |
| X | X | H | X | H | L |
| X | X | X | H | H | L |
| H | H | H | H | H | L |

## ABSOLUTE MAXIMUM RATINGS[1]

| Symbol | Rating | Value | Unit |
|---|---|---|---|
| $V_{CC}$ | Power Supply Voltage ($V_{EE}$ = 0) | –6.0 to 0 | V |
| $V_{EE}$ | Power Supply Voltage ($V_{CC}$ = 0) | +6.0 to 0 | V |
| $V_I$ | Input Voltage ($V_{CC}$ = 0V)<br>Input Voltage ($V_{EE}$ = 0V) | –6.0 to 0<br>+6.0 to 0 | V<br>V |
| $I_{OUT}$ | Output Current –Continuous<br>–Surge | 50<br>100 | mA |
| $T_A$ | Operating Temperature Range | –40 to +85 | °C |
| $T_{store}$ | Storage Temperature Range | –65 to +150 | °C |

**Note 1.** Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded. This is a stress rating only and functional operation is not implied at conditions other than those detailed in the operational sections of this data sheet. Exposure to ABSOLUTE MAXIMUM RATING conditions for extended periods may affect device reliability.

## DC ELECTRICAL CHARACTERISTICS[1]

$V_{CC}$ = 0V; $V_{EE}$ = –5.5V to –3.0V; $V_{CC}$ = 3.0V to 5.5V, $V_{EE}$ = 0V[2]

| Symbol | Parameter | $T_A$ = –40°C | | | $T_A$ = +25°C | | | $T_A$ = +85°C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| $I_{EE}$ | Power Supply Current[3] | — | — | 31 | — | 20 | 31 | — | — | 31 | mA |
| $V_{OH}$ | Output HIGH Voltage[4] | –1135 | — | –0885 | –1070 | –0945 | –0820 | –1010 | — | –0760 | mV |
| $V_{OL}$ | Outuput LOW Voltage[4] | –1935 | — | –1685 | –1870 | –1745 | –1630 | –1810 | — | –1560 | mV |
| $V_{IH}$ | Input HIGH Voltage | –1210 | — | –0885 | –1145 | — | –0820 | –1085 | — | –0760 | mV |
| $V_{IL}$ | Input LOW Voltage | –1935 | — | –1610 | –1870 | — | –1545 | –1810 | — | –1485 | mV |
| $I_{IH}$ | Input HIGH Current | — | — | 150 | — | — | 150 | — | — | 150 | µA |
| $I_{IL}$ | Input LOW Current | 0.5 | — | — | 0.5 | — | — | 0.5 | — | — | µA |

**Note 1.** 10EP circuits are designed to meet the DC specifications shown in the above table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and traverse airflow greater than 500lfpm is maintained.

**Note 2.** Input and output parameters vary 1:1 with $V_{CC}$.

**Note 3.** $V_{CC}$ = 0V, $V_{EE}$ = $V_{EE}$(min) to $V_{EE}$(max), all other pins floating.

**Note 4.** All loading with 50Ω to $V_{CC}$ – 2.0V.

## AC ELECTRICAL CHARACTERISTICS

$V_{CC}$ = 0V, $V_{EE}$ = –3.0V to –5.5V; $V_{CC}$ = 3.0V to 5.5V, $V_{EE}$ = 0V

| Symbol | Parameter | $T_A$ = –40°C | | | $T_A$ = +25°C | | | $T_A$ = +85°C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| $f_{MAX}$ | Maximum Toggle Frequency(1) | — | — | — | — | 3 | — | — | — | — | GHz |
| $t_{PLH}$<br>$t_{PHL}$ | Propagation Delay to Output Differential D → Q, /Q | 100 | — | 300 | 150 | 200 | 250 | 200 | — | 300 | ps |
| $t_{SKEW}$ | Device Skew(2) | — | — | — | — | 5 | 20 | — | — | 20 | ps |
| $t_r$<br>$t_f$ | Output Rise/Fall Times Q (20% to 80%) | 60 | — | 180 | 60 | 110 | 180 | 70 | — | 180 | ps |

**Note 1.** $f_{MAX}$ guaranteed for functionality only. $V_{OL}$ and $V_{OH}$ levels are guaranteed at DC only.

**Note 2.** Skew difference between all inputs to output. Parameter not tested.

## PRODUCT ORDERING CODE

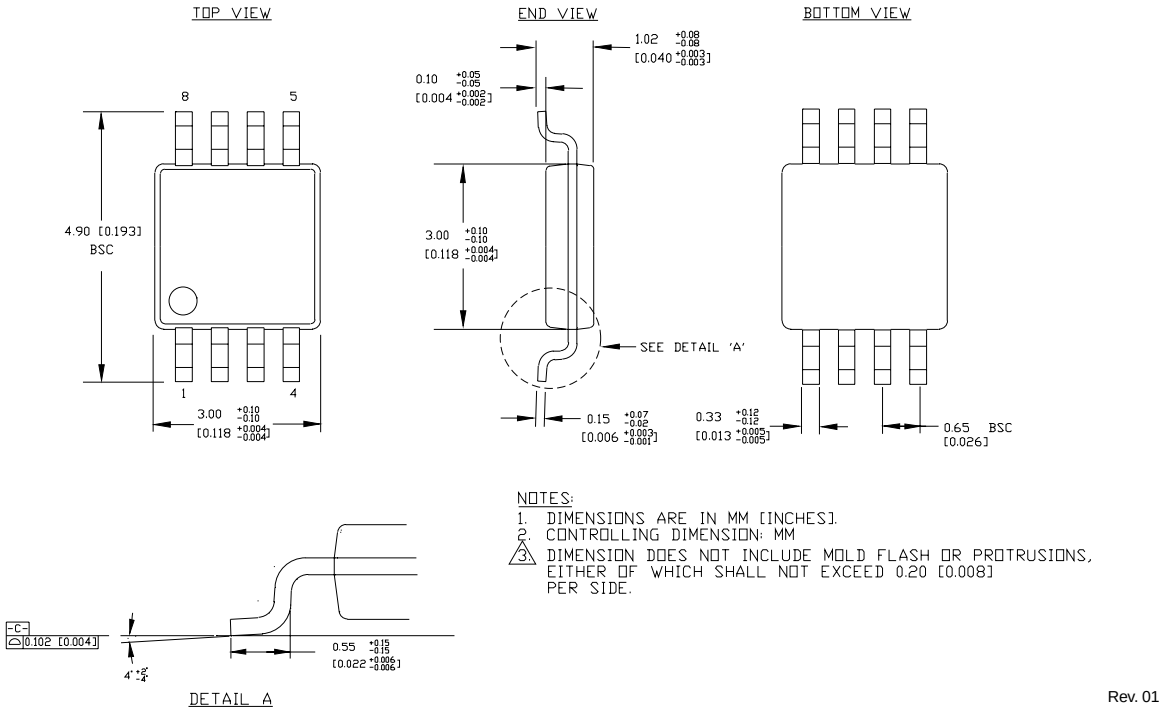
| Ordering Code | Package Type | Operating Range | Package Marking |
|---|---|---|---|
| SY10EP01VZC | Z8-1 | Commercial | HEP01 |
| SY10EP01VZCTR(1) | Z8-1 | Commercial | HEP01 |
| SY10EP01VKC | K8-1 | Commercial | HP01 |
| SY10EP01VKCTR(1) | K8-1 | Commercial | HP01 |

| Ordering Code | Package Type | Operating Range | Package Marking |
|---|---|---|---|
| SY10EP01VZI(2) | Z8-1 | Industrial | HEP01 |
| SY10EP01VZITR(1,2) | Z8-1 | Industrial | HEP01 |
| SY10EP01VKI(2) | K8-1 | Industrial | HP01 |
| SY10EP01VKITR(1,2) | K8-1 | Industrial | HP01 |

**Note 1.** Tape and Reel.

**Note 2.** Recommended for new designs.

# 8 LEAD MSOP (K8-1)







DETAIL A

NOTES:
1. DIMENSIONS ARE IN MM [INCHES].
2. CONTROLLING DIMENSION: MM
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.20 [0.008] PER SIDE.

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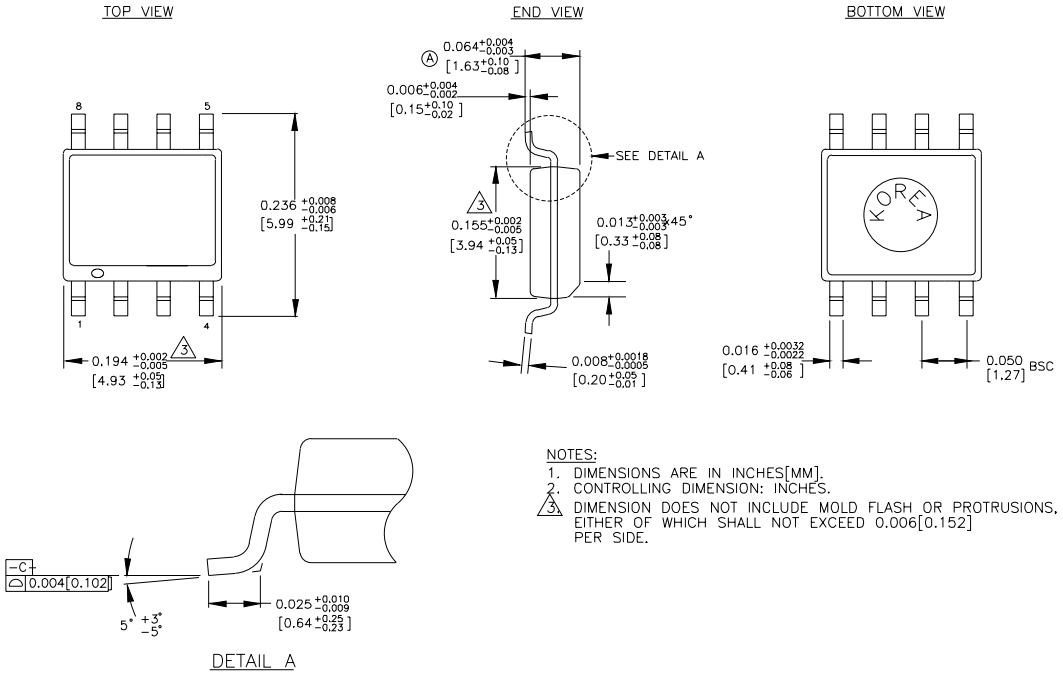
## 8 LEAD PLASTIC SOIC (Z8-1)




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 0.006[0.152] PER SIDE.

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