

## OBJECTIVE SPECIFICATION

82S290-F,N • 82S291-F,N

## DESCRIPTION

The 82S290 and 82S291 include on-chip decoding and 3 programmable chip enable inputs for ease of memory expansion. They feature either open collector or tri-state outputs for optimization of word expansion in bused organizations.

Both 82S290 and 82S291 devices are available in the commercial and military temperature ranges. For the commercial temperature range (0°C to +75°C) specify N82S290/291, F or N, and for the military temperature range (-55°C to +125°C) specify S82S290/291, F.

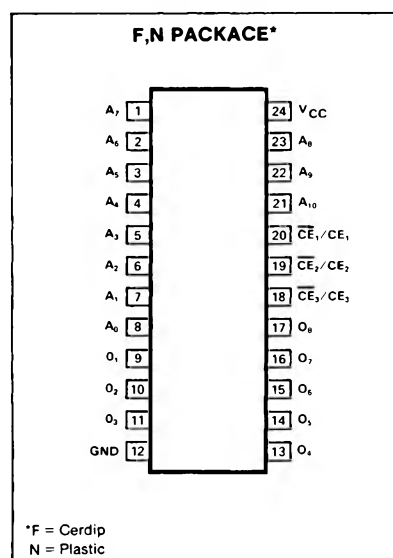
## FEATURES

- Address access time:  
N82S290/291: 80ns max  
S82S290/291: 100ns max
- Power dissipation: 40μW/bit typ
- Input loading:  
N82S290/291: -100μA max  
S82S290/291: -150μA max
- On-chip address decoding
- Output options:  
82S290: Open collector  
82S291: Tri-state
- Fully compatible with Signetics 82S190/191 PROMs
- Fully TTL compatible

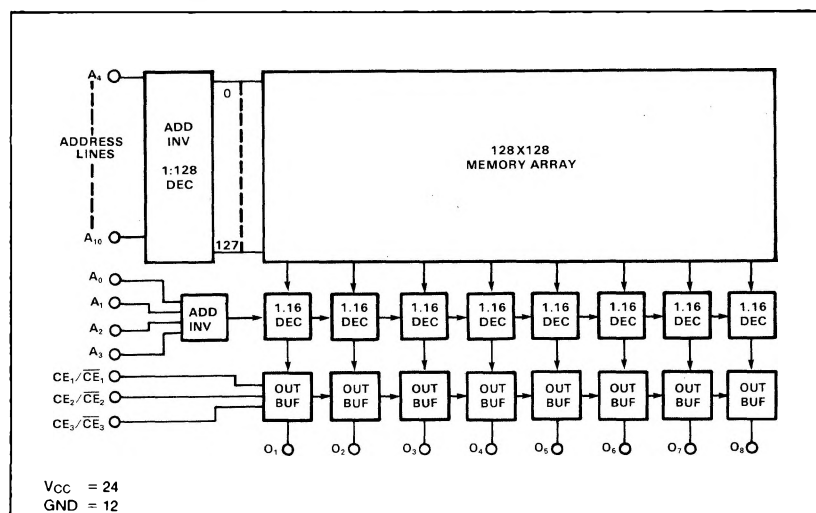
## APPLICATIONS

- Sequential controllers
- Microprogramming
- Hardwired algorithms
- Control store
- Random logic
- Code conversion

## PIN CONFIGURATION



## BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

| PARAMETER        |                    | RATING      | UNIT            |
|------------------|--------------------|-------------|-----------------|
| V <sub>CC</sub>  | Supply voltage     | +7          | V <sub>dc</sub> |
| V <sub>IN</sub>  | Input voltage      | +5.5        | V <sub>dc</sub> |
|                  | Output voltage     |             | V <sub>dc</sub> |
| V <sub>OH</sub>  | High (82S290)      | +5.5        |                 |
| V <sub>O</sub>   | Off-state (82S291) | +5.5        |                 |
|                  | Temperature range  |             | °C              |
| T <sub>A</sub>   | Operating          |             |                 |
|                  | N82S290/291        | 0 to +75    |                 |
|                  | S82S290/291        | -55 to +125 |                 |
| T <sub>STG</sub> | Storage            | -65 to +150 |                 |

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## DC ELECTRICAL CHARACTERISTICS

N82S290/291:  $0^{\circ}\text{C} \leq T_A \leq +75^{\circ}\text{C}$ ,  $4.75\text{V} \leq V_{CC} \leq 5.25\text{V}$ S82S290/291:  $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ ,  $4.5\text{V} \leq V_{CC} \leq 5.5\text{V}$ 

| PARAMETER                        | TEST CONDITIONS <sup>1</sup>                                                                                                                                                  | N82S290/291 |                  |                 | S82S290/291 |                  |                 | UNIT          |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-----------------|-------------|------------------|-----------------|---------------|
|                                  |                                                                                                                                                                               | Min         | Typ <sup>2</sup> | Max             | Min         | Typ <sup>2</sup> | Max             |               |
| $V_{IL}$<br>$V_{IH}$<br>$V_{IC}$ | Input voltage<br>Low<br>High<br>Clamp                                                                                                                                         |             |                  |                 |             |                  |                 | V             |
|                                  |                                                                                                                                                                               | 2.0         | -0.8             | -1.2            | 2.0         | -0.8             | -1.2            |               |
| $V_{OL}$<br>$V_{OH}$             | Output voltage<br>Low<br>High (82S291)                                                                                                                                        |             |                  |                 |             |                  |                 | V             |
|                                  | $I_{OUT} = 9.6\text{mA}$<br>$\overline{CE} = \text{Low}$ , $I_{OUT} = -2.4\text{mA}$ ,<br>High stored                                                                         | 2.4         |                  | 0.45            | 2.4         |                  | 0.5             |               |
| $I_{IL}$<br>$I_{IH}$             | Input current<br>Low<br>High                                                                                                                                                  |             |                  |                 |             |                  |                 | $\mu\text{A}$ |
|                                  | $V_{IN} = 0.45\text{V}$<br>$V_{IN} = 5.5\text{V}$                                                                                                                             |             |                  | -100<br>40      |             |                  | -150<br>50      |               |
| $I_{OLK}$<br>$I_{O(OFF)}$        | Output current<br>Leakage (82S290)<br>Hi-Z state (82S291)                                                                                                                     |             |                  |                 |             |                  |                 | $\mu\text{A}$ |
|                                  | $\overline{CE} = \text{High}$ , $V_{OUT} = 5.5\text{V}$<br>$\overline{CE} = \text{High}$ , $V_{OUT} = 0.5\text{V}$<br>$\overline{CE} = \text{High}$ , $V_{OUT} = 5.5\text{V}$ |             |                  | 40<br>-40<br>40 |             |                  | 60<br>-60<br>60 | $\mu\text{A}$ |
| $I_{OS}$                         | Short circuit (82S291)                                                                                                                                                        |             |                  |                 |             |                  |                 | $\text{mA}$   |
|                                  | $V_{OUT} = 0\text{V}$                                                                                                                                                         | -20         |                  | -70             | -15         |                  | -85             |               |
| $I_{CC}$                         | $V_{CC}$ supply current                                                                                                                                                       |             | 130              | 170             |             | 130              | 180             | $\text{mA}$   |
| $C_{IN}$<br>$C_{OUT}$            | Capacitance<br>Input<br>Output                                                                                                                                                |             |                  |                 |             |                  |                 | $\text{pF}$   |
|                                  | $V_{CC} = 5.0\text{V}$<br>$V_{IN} = 2.0\text{V}$<br>$V_{OUT} = 2.0\text{V}$                                                                                                   |             | 5<br>8           |                 |             | 5<br>8           |                 |               |

## AC ELECTRICAL CHARACTERISTICS

 $R_1 = 270\Omega$ ,  $R_2 = 600\Omega$ ,  $C_L = 30\text{pF}$ <sup>1</sup>N82S290/291:  $0^{\circ}\text{C} \leq T_A \leq +75^{\circ}\text{C}$ ,  $4.75\text{V} \leq V_{CC} \leq 5.25\text{V}$ S82S290/291:  $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ ,  $4.5\text{V} \leq V_{CC} \leq 5.5\text{V}$ 

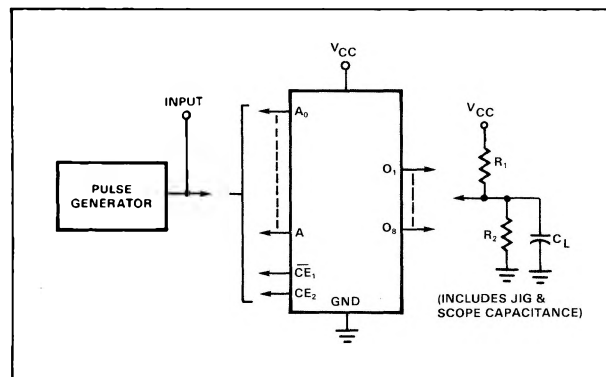
| PARAMETER            | TO                              | FROM                   | N82S290/291 |                  |          | S82S290/291 |                  |           | UNIT |
|----------------------|---------------------------------|------------------------|-------------|------------------|----------|-------------|------------------|-----------|------|
|                      |                                 |                        | Min         | Typ <sup>2</sup> | Max      | Min         | Typ <sup>2</sup> | Max       |      |
| $T_{AA}$<br>$T_{CE}$ | Access time<br>Output<br>Output | Address<br>Chip enable |             | 50<br>20         | 80<br>40 |             | 50<br>20         | 100<br>50 | ns   |
| $T_{CD}$             | Disable time<br>Output          | Chip disable           |             | 20               | 40       |             | 20               | 50        | ns   |

## NOTES

1. Positive current is defined as into the terminal referenced.

2. Typical values are at  $V_{CC} = 5.0\text{V}$ ,  $T_A = +25^{\circ}\text{C}$ .

## TEST LOAD CIRCUIT



## VOLTAGE WAVEFORM

