**Philips Components–Signetics**

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| Memory Products | |

# 82S191 / 82S191A

## 16K-bit TTL bipolar PROM

### DESCRIPTION

The 82S191 and 82S191A are field programmable, which means that custom patterns are immediately available by following the Signetics Generic I fusing procedure. The 82S191 and 82S191A are supplied with all outputs at logical Low. Outputs are programmed to a logic High level at any specified address by fusing the Ni-Cr link matrix.

This device includes on-chip decoding and 3 Chip Enable inputs for ease of memory expansion. It features 3-State outputs for optimization of word expansion in bused organizations.

Ordering information can be found on the following page.

The 82S191 and 82S191A devices are also processed to military requirements for operation over the military temperature range. For specifications and ordering information consult the Signetics Military Data Handbook.

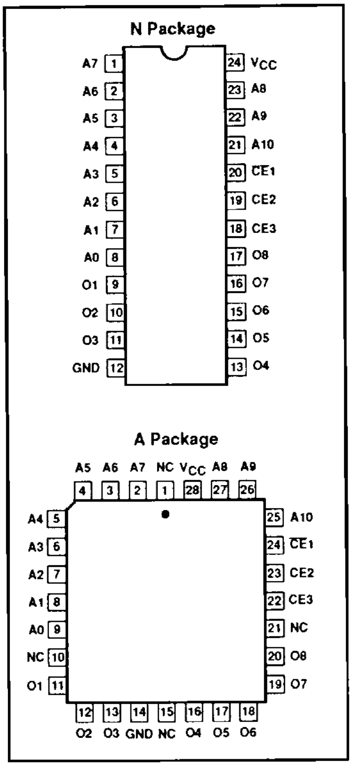
### FEATURES

- Address access time:
  - N82S191: 80ns max
  - N82S191A: 55ns max
- Power dissipation: 40μW/bit typ
- Input loading: −100μA max
- Three Chip Enable inputs
- On-chip address decoding
- No separate fusing pins
- Unprogrammed outputs are Low level
- Fully TTL compatible
- Outputs: 3-State

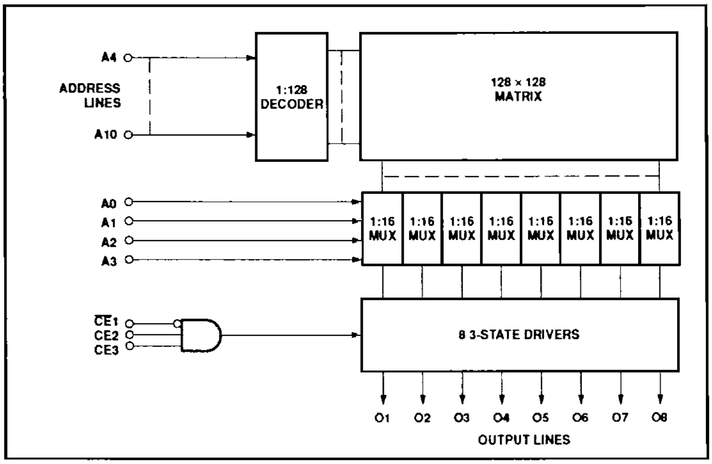
### APPLICATIONS

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

### PIN CONFIGURATIONS



### BLOCK DIAGRAM



## ORDERING INFORMATION

| DESCRIPTION | ORDER CODE |
|---|---|
| 24-Pin Plastic Dual-In-Line<br>600mil-wide | N82S191 N, N82S191A N |
| 28-Pin Plastic Leaded Chip Carrier<br>450mil-square | N82S191 A, N82S191A A |

## ABSOLUTE MAXIMUM RATINGS

| SYMBOL | PARAMETER | RATING | UNIT |
|---|---|---|---|
| $V_{CC}$ | Supply voltage | +7.0 | $V_{DC}$ |
| $V_{IN}$ | Input voltage | +5.5 | $V_{DC}$ |
| $V_O$ | Output voltage Off-State | +5.5 | $V_{DC}$ |
| $T_{amb}$ | Operating temperature range | 0 to +75 | °C |
| $T_{stg}$ | Storage temperature range | -65 to +150 | °C |

## DC ELECTRICAL CHARACTERISTICS

$0°C \leq T_{amb} \leq +75°C$, $4.75V \leq V_{CC} \leq 5.25V$

| SYMBOL | PARAMETER | TEST CONDITIONS[1,2] | LIMITS | | | UNIT |
|---|---|---|---|---|---|---|
| | | | Min | Typ[3] | Max | |
| **Input voltage** | | | | | | |
| $V_{IL}$ | Low | | | | 0.8 | V |
| $V_{IH}$ | High | | 2.0 | | | V |
| $V_{IC}$ | Clamp | $I_{IN}$ = -12mA | | -0.8 | -1.2 | V |
| **Output voltage** | | | | | | |
| | | $\overline{\text{CE}}1$ = Low, CE2,3 = High | | | | |
| $V_{OL}$ | Low | $I_{OUT}$ = 9.6mA | | | 0.45 | V |
| $V_{OH}$ | High | $I_{OUT}$ = -2.0mA | 2.4 | | | V |
| **Input current[1]** | | | | | | |
| $I_{IL}$ | Low | $V_{IN}$ = 0.45V | | | -100 | µA |
| $I_{IH}$ | High | $V_{IN}$ = 5.5V | | | 40 | µA |
| **Output current[1]** | | | | | | |
| $I_{OZ}$ | Hi-Z state | $\overline{\text{CE}}1$ = High, CE2,3 = Low, $V_{OUT}$ = 0.5V | | | -40 | µA |
| | | $\overline{\text{CE}}1$ = High, CE2,3 = Low, $V_{OUT}$ = 5.5V | | | 40 | µA |
| $I_{OS}$ | Short circuit[4] | $\overline{\text{CE}}1$ = Low, CE2,3 = High, $V_{OUT}$ = 0V | -15 | | -70 | mA |
| **Supply current[5]** | | | | | | |
| $I_{CC}$ | | $V_{CC}$ = 5.25V | | 130 | 175 | mA |
| **Capacitance** | | | | | | |
| | | $\overline{\text{CE}}1$ = High, CE2,3 = Low, $V_{CC}$ = 5.0V | | | | |
| $C_{IN}$ | Input | $V_{IN}$ = 2.0V | | 5 | | pF |
| $C_{OUT}$ | Output | $V_{OUT}$ = 2.0V | | 8 | | pF |

**NOTES:**

1. Positive current is defined as into the terminal referenced.
2. All voltages with respect to network ground.
3. Typical values are at $V_{CC}$ = 5V, $T_{amb}$ = +25°C.
4. Duration of the short circuit should not exceed 1 second.
5. Measured with all inputs grounded and all outputs open.

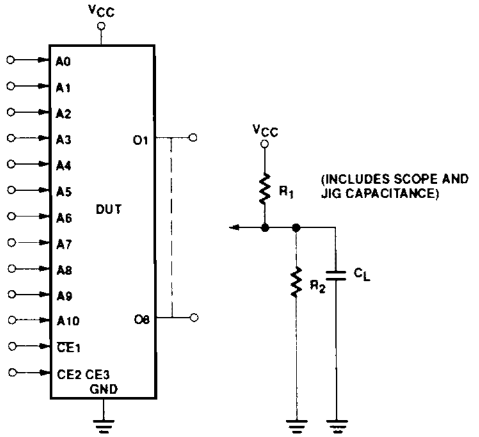
## AC ELECTRICAL CHARACTERISTICS

$R_1 = 470\Omega$, $R_2 = 1k\Omega$, $C_L = 30pF$, $0°C \leq T_{amb} \leq +75°C$, $4.75V \leq V_{CC} \leq 5.25V$

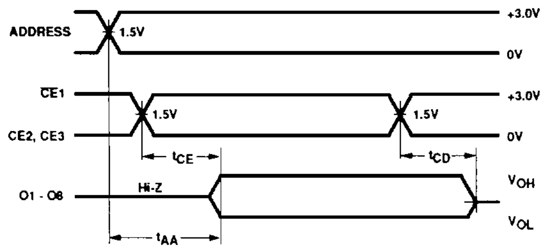
| SYMBOL | PARAMETER | TO | FROM | N82S191 Min | N82S191 Typ[1] | N82S191 Max | N82S191A Min | N82S191A Typ[1] | N82S191A Max | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| **Access time[2]** | | | | | | | | | | |
| $t_{AA}$ | | Output | Address | | 50 | 80 | | 50 | 55 | ns |
| $t_{CE}$ | | Output | Chip Enable | | 30 | 40 | | 20 | 30 | ns |
| **Disable time[3]** | | | | | | | | | | |
| $t_{CD}$ | | Output | Chip Disable | | 30 | 40 | | 20 | 30 | ns |

NOTES:
1. Typical values are $V_{CC} = 5V$, $T_{amb} = +25°C$.
2. Tested at an address cycle time of 1µs.
3. Measured at a delta of 0.5V from Logic Level with $R_1 = 750\Omega$, $R_2 = 750\Omega$ and $C_L = 5pF$.

## TEST LOAD CIRCUIT



## VOLTAGE WAVEFORM



NOTES:
All inputs $t_r = t_f = 5ns$ (10% to 90%)
All AC parameters are measured at 1.5V unless otherwise specified.