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| Memory Products |                       |

# 82S23

# 82S123

## 256-bit TTL bipolar PROM

### DESCRIPTION

The 82S23 and 82S123 are field programmable, which means that custom patterns are immediately available by following the Signetics Generic I fusing procedure. The 82S23 and 82S123 devices are supplied with all outputs at logical Low. Outputs are programmed to a logic High level at any specified address by fusing a Ni-Cr link matrix.

These devices include on-chip decoding and 1 Chip Enable input for memory expansion. They feature either Open Collector or 3-State outputs for optimization of word expansion in bused organizations.

Ordering information can be found on the following page.

The 82S23 and 82S123 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.

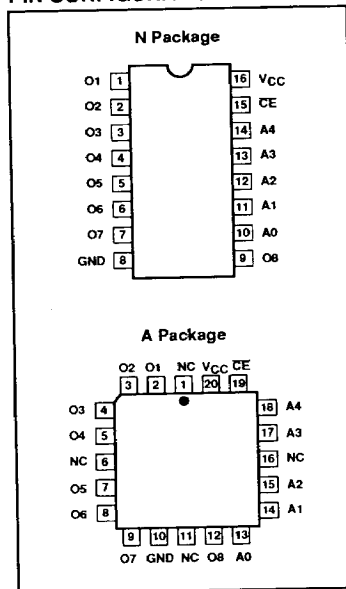
### FEATURES

- Address access time: 50ns max
- Power dissipation: 1.3mW/bit typ
- Input loading:  $-100\mu\text{A}$  max
- On-chip address decoding
- One Chip Enable input
- Output options:
  - N82S23: Open Collector
  - N82S123: 3-State
- No separate fusing pins
- Unprogrammed outputs are Low level
- Fully TTL compatible

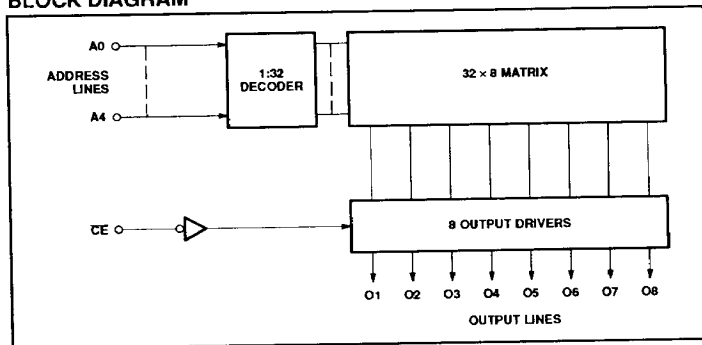
### APPLICATIONS

- Prototyping/volume production
- Sequential controllers
- Format conversion
- Hardwired algorithms
- Random logic
- Code conversion

### PIN CONFIGURATIONS



### BLOCK DIAGRAM



**256-bit TTL bipolar PROM (32 × 8)****82S23 / 82S123****ORDERING INFORMATION**

| DESCRIPTION                                         | ORDER CODE          |
|-----------------------------------------------------|---------------------|
| 16-Pin Plastic Dual-In-Line<br>300mil-wide          | N82S23 N, N82S123 N |
| 20-Pin Plastic Leaded Chip Carrier<br>350mil-square | N82S23 A, N82S123 A |

**ABSOLUTE MAXIMUM RATINGS**

| SYMBOL    | PARAMETER                         | RATING      | UNIT     |
|-----------|-----------------------------------|-------------|----------|
| $V_{CC}$  | Supply voltage                    | +7.0        | $V_{DC}$ |
| $V_{IN}$  | Input voltage                     | +5.5        | $V_{DC}$ |
| $V_{OH}$  | Output voltage High (82S23)       | +5.5        | $V_{DC}$ |
| $V_O$     | Output voltage Off-State (82S123) | +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** $0^\circ\text{C} \leq T_{amb} \leq +75^\circ\text{C}$ ,  $4.75\text{V} \leq V_{CC} \leq 5.25\text{V}$ 

| SYMBOL                      | PARAMETER                           | TEST CONDITIONS <sup>1,2</sup>                              | LIMITS |                  |      | UNIT |
|-----------------------------|-------------------------------------|-------------------------------------------------------------|--------|------------------|------|------|
|                             |                                     |                                                             | MIN    | TYP <sup>3</sup> | MAX  |      |
| Input voltage               |                                     |                                                             |        |                  |      |      |
| V <sub>IL</sub>             | Low                                 | V <sub>CC</sub> = 4.75V                                     | 2.0    |                  | 0.8  | V    |
| V <sub>IH</sub>             | High                                | V <sub>CC</sub> = 5.25V                                     |        |                  | V    |      |
| V <sub>IC</sub>             | Clamp                               | I <sub>IN</sub> = -12mA                                     |        |                  | -1.2 | V    |
| Output voltage              |                                     |                                                             |        |                  |      |      |
| V <sub>OL</sub>             | Low                                 | CE = Low<br>I <sub>OUT</sub> = 16mA                         | 2.4    |                  | 0.45 | V    |
| V <sub>OH</sub>             | High                                | I <sub>OUT</sub> = -2.0mA                                   |        |                  | V    |      |
| Input current               |                                     |                                                             |        |                  |      |      |
| I <sub>IL</sub>             | Low                                 | V <sub>IN</sub> = 0.45V                                     |        |                  | -100 | μA   |
| I <sub>IH</sub>             | High                                | V <sub>IN</sub> = 5.5V                                      |        |                  | 50   | μA   |
| Output current              |                                     |                                                             |        |                  |      |      |
| I <sub>OLK</sub>            | Leakage (82S23)                     | CE = High, V <sub>OUT</sub> = 5.5V                          | -15    |                  | 40   | μA   |
| I <sub>OZ</sub>             | Hi-Z state (82S123)                 | CE = High, V <sub>OUT</sub> = 5.5V                          |        |                  | 40   | μA   |
|                             |                                     | CE = High, V <sub>OUT</sub> = 0.5V                          |        |                  | -40  | μA   |
| I <sub>OS</sub>             | Short circuit (82S123) <sup>4</sup> | CE = Low, V <sub>OUT</sub> = 0V, High stored                |        |                  | -90  | mA   |
|                             |                                     |                                                             |        |                  |      |      |
| Supply current <sup>5</sup> |                                     |                                                             |        |                  |      |      |
| I <sub>CC</sub>             |                                     | V <sub>CC</sub> = 5.25V                                     |        |                  | 96   | mA   |
| Capacitance                 |                                     |                                                             |        |                  |      |      |
| C <sub>IN</sub>             | Input                               | CE = High, V <sub>CC</sub> = 5.0V<br>V <sub>IN</sub> = 2.0V |        | 5                |      | pF   |
| C <sub>OUT</sub>            | Output                              | V <sub>OUT</sub> = 2.0V                                     |        |                  |      | 8    |

**NOTES:**

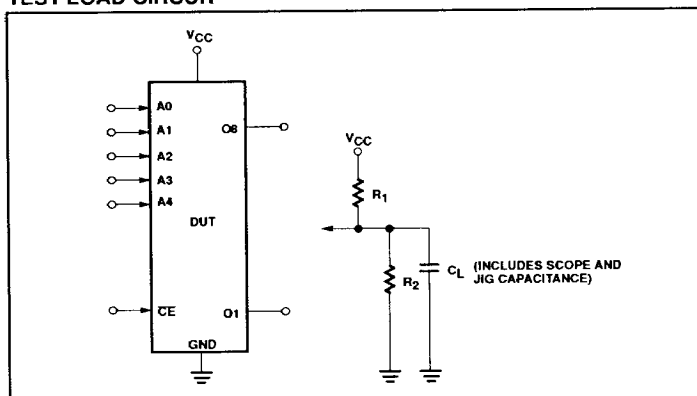
1. Positive current is defined as into the terminal referenced.
2. All voltages with respect to network ground terminal.
3. Typical values are at  $V_{CC} = 5\text{V}$ ,  $T_{amb} = +25^\circ\text{C}$ .
4. Duration of short circuit should not exceed 1 second.
5. Measured with all inputs grounded and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

**256-bit TTL bipolar PROM (32 × 8)****82S23 / 82S123****AC ELECTRICAL CHARACTERISTICS**
 $R_1 = 270\Omega$ ,  $R_2 = 600\Omega$ ,  $C_L = 30\text{pF}$ ,  $0^\circ\text{C} \leq T_{\text{amb}} \leq +75^\circ\text{C}$ ,  $4.75\text{V} \leq V_{\text{CC}} \leq 5.25\text{V}$ 

| H <sub>1</sub> = 27052, H <sub>2</sub> = 60052, C <sub>1</sub> = 3001, C <sub>2</sub> = 15001, V <sub>amb</sub> ≤ +7.5 V, 0 V ≤ V <sub>CC</sub> ≤ 5.5 V |           |        |              |        |                  |     |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|--------------|--------|------------------|-----|------|
| SYMBOL                                                                                                                                                  | PARAMETER | TO     | FROM         | LIMITS |                  |     | UNIT |
|                                                                                                                                                         |           |        |              | MIN    | TYP <sup>1</sup> | MAX |      |
| Access time <sup>2</sup>                                                                                                                                |           |        |              |        |                  |     |      |
| t <sub>AA</sub>                                                                                                                                         |           | Output | Address      |        | 45               | 50  | ns   |
| t <sub>CE</sub>                                                                                                                                         |           | Output | Chip Enable  |        |                  | 35  | ns   |
| Disable time <sup>3</sup>                                                                                                                               |           |        |              |        |                  |     |      |
| t <sub>CD</sub>                                                                                                                                         |           | Output | Chip Disable |        |                  | 35  | ns   |

**NOTES:**

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

**TEST LOAD CIRCUIT****VOLTAGE WAVEFORM**