

27HC128 O.T.P. One Time Programmable 128K (16K × 8) EPROMs

Preliminary Specification

Application Specific Products

DESCRIPTION

The 27HC128 CMOS, O.T.P. EPROM is a high-speed electrically programmable Read Only Memory. It is organized as 16,384 words of 8 bits and operates from a single $5V \pm 10\%$ power supply. All outputs offer 3-State operation and are fully TTL compatible.

The 27HC128 uses advanced CMOS circuitry which allows operation at bipolar PROM speeds while consuming lower power. The highest degree of protection against latch-up is achieved through epitaxial processing simplifying the design of electronic equipment which is subject to high noise environments.

The 27HC128 is available in industry standard packages with the same pin-out as most 128K bipolar PROMs. This makes it easy to upgrade systems currently using bipolar PROMs and provide a lower power memory system solution.

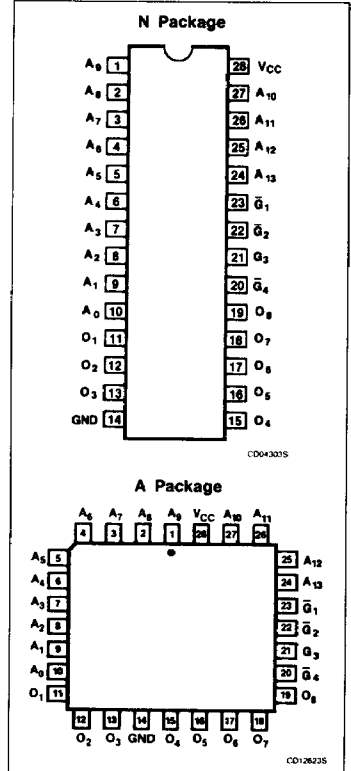
FEATURES

- Address access time:
 - 27HC128-55 55ns max
 - 27HC128-45 45ns max
- Operating I_{CC} : 110mA max
- 3-State outputs
- JEDEC standard 28-pin DIP and 28-pin PLCC package
- Direct replacement for standard 128K TTL PROMs
- Fully TTL compatible

APPLICATIONS

- Prototyping and volume production
- High-performance mini- and microcomputers
- High-speed program store and look-up tables

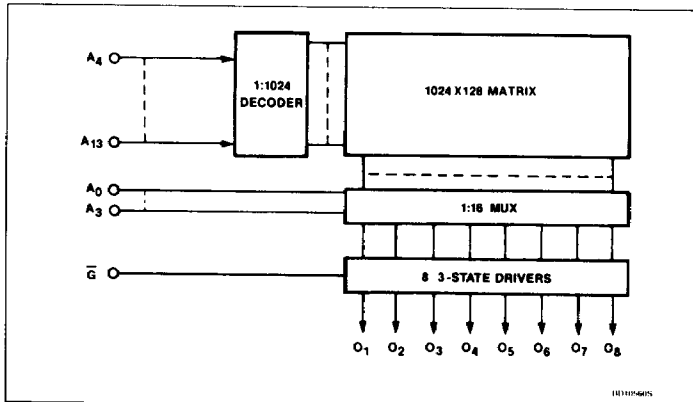
PIN CONFIGURATIONS



ORDERING INFORMATION

| DESCRIPTION | ORDER CODE | |
|------------------------------------|--------------|--------------|
| | 45ns | 55ns |
| 28-pin plastic DIP (600mil-wide) | 27HC128-45 N | 27HC128-55 N |
| 28-pin plastic leaded chip carrier | 27HC128-45 A | 27HC128-55 A |

BLOCK DIAGRAM



PIN NAMES

| | |
|----------------------------------|---------------------------|
| A ₀ - A ₁₃ | Address inputs |
| O ₁ - O ₈ | Data outputs |
| \bar{G} - \bar{G} | Output Enables |
| V _{CC} | Supply voltage |
| GND | Ground (V _{SS}) |

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ABSOLUTE MAXIMUM RATINGS¹

| SYMBOL | PARAMETER | RATING | UNIT |
|------------|---------------------------------|-----------------------|------|
| V_i, V_O | Voltage on any pin ² | -0.5 to $V_{CC} + 1V$ | V |
| T_A | Temperature under bias | -10 to +85 | °C |
| T_{STG} | Storage temperature range | -65 to +150 | °C |
| V_{PP} | Voltage on \bar{G} pin | -0.5 to 13.5 | V |

DC OPERATING CONDITIONS $0^\circ\text{C} \leq T_A \leq +70^\circ\text{C}$

| SYMBOL | PARAMETER | TEST CONDITIONS | LIMITS | | | UNIT |
|-----------------------|-----------|-----------------|--------|-----|----------------|------|
| | | | Min | Typ | Max | |
| Supply voltage | | | | | | |
| V_{CC} | | GND = 0V | 4.5 | 5.0 | 5.5 | V |
| Input voltage | | | | | | |
| V_{IH} | High | | 2.0 | | $V_{CC} + 0.5$ | V |
| V_{IL} | Low | | -0.1 | | 0.8 | V |

DC ELECTRICAL CHARACTERISTICS $0^\circ\text{C} \leq T_A \leq +70^\circ\text{C}, 4.5V \leq V_{CC} \leq 5.5V$

| SYMBOL | PARAMETER | TEST CONDITIONS | LIMITS | | | UNIT |
|--------------------------------|---|--|--------|-----|----------|---------------|
| | | | Min | Typ | Max | |
| Input Current | | | | | | |
| I_{IH} | High | $V_{IN} = V_{CC}$ | | | 10 | μA |
| I_{IL}^3 | Low | $V_{IN} = 0.45V$ | | | 10 | μA |
| Output Current | | | | | | |
| I_{LO} | Leakage | $V_{OUT} = 0$ to V_{CC} | | | ± 10 | μA |
| I_{OS} | Output short-circuit current ⁴ | $V_{OUT} = 0V, \bar{G} = V_{IL}$ | -15 | | -70 | mA |
| Supply Current | | | | | | |
| I_{CC} | V_{CC} operating current | $\bar{G} = V_{IH}, O_1 - O_8 = 0mA, f = 20MHz$ | | | 110 | mA |
| Input Voltage | | | | | | |
| V_{IC} | Input clamp voltage | $I_{IC} = -12mA$ | | | -1.2 | V |
| Output Voltage | | | | | | |
| V_{OH} | High | $I_{OH} = -4mA$ | 2.4 | | | V |
| V_{OL} | Low | $I_{OL} = 16mA$ | | | 0.45 | V |
| Capacitance⁵ | | | | | | |
| C_{IN} | Input | $f = 1MHz, T_A = 25^\circ\text{C}$ $V_{CC} = 5.0V$ $V_{IN} = 0V$ | | | 6 | pF |
| C_{OUT} | Output | $V_{OUT} = 5.0V$ | | | 12 | pF |

NOTES:

- Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.
- Minimum DC input voltage is -0.5V. During transitions the inputs may undershoot to -2.0V for periods less than 20ns.
- Input current for \bar{G} input only = -100 μA .
- Test one output at a time for 1 sec max.
- Capacitance limits are sampled and not 100% tested.

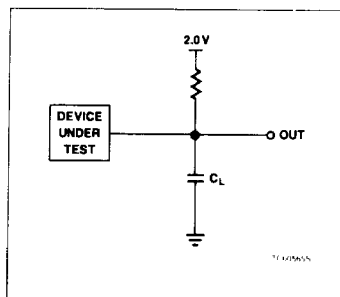
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AC ELECTRICAL CHARACTERISTICS $C_L = 30\text{pF}$, $R_1 = 98\Omega$, $0^\circ\text{C} < T_A < +70^\circ\text{C}$, $4.5\text{V} < V_{CC} \leq 5.5\text{V}$

| SYMBOL | PARAMETER | TO | FROM | 27HC128-45 | | 27HC128-55 | | UNIT |
|----------|---------------------------|--------|---------------|------------|-----|------------|-----|------|
| | | | | Min | Max | Min | Max | |
| t_{AA} | Address access time | Output | Address | | 45 | | 55 | ns |
| t_{ES} | Output Enable access time | Output | Output Enable | | 25 | | 30 | ns |
| t_{EO} | Output disable time | Output | Output Enable | | 25 | | 30 | ns |

AC TEST LOAD CIRCUIT



VOLTAGE WAVEFORMS

