NEC Electronics Inc.

# μPD23C1000A
# 131,072 x 8-Bit
# Mask-Programmable CMOS ROM

## Description

The μPD23C1000A is a 131,072-word by 8-bit static ROM fabricated with CMOS silicon-gate technology and designed to operate from a single +5-volt power supply. The device has three-state outputs and fully TTL-compatible inputs and outputs, and is available in 28-pin plastic DIP or miniflat packaging.

## Features

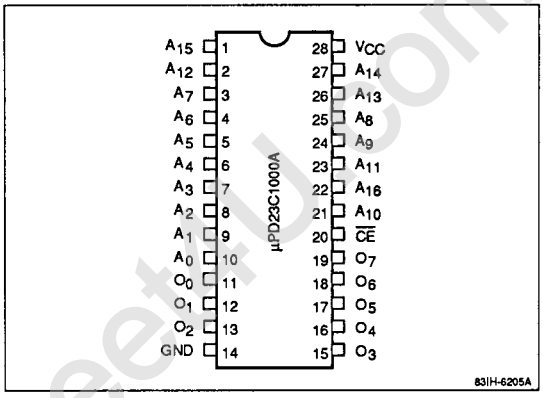
- 131,072-word by 8-bit organization
- TTL-compatible inputs and outputs
- Three-state outputs
- Single +5-volt power supply
- CMOS process technology
- Fully static operation
- Low power dissipation
  - 220 mW (active)
  - 550 μW (standby)

## Ordering Information

| Part Number | Access Time (max) | Package |
|---|---|---|
| μPD23C1000AC | 200 ns | 28-pin plastic DIP |
| μPD23C1000AG | 200 ns | 28-pin plastic miniflat |

## Pin Configuration

***28-Pin Plastic DIP or Miniflat***




## Pin Identification

| Symbol | Function |
|---|---|
| $A_0$ - $A_{16}$ | Address inputs |
| $O_0$ - $O_7$ | Data outputs |
| $\overline{CE}$ | Chip enable |
| GND | Ground |
| $V_{CC}$ | +5-volt power supply |



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## Absolute Maximum Ratings

| | |
|---|---|
| Supply voltage, $V_{CC}$ | −0.3 to +7.0 V |
| Input voltage, $V_I$ | −0.3 V to $V_{CC}$ + 0.3 V |
| Output voltage, $V_O$ | −0.3 V to $V_{CC}$ + 0.3 V |
| Operating temperature, $T_{OPR}$ | −10 to +70°C |
| Storage temperature, $T_{STG}$ | −65 to +150°C |

Exposure to Absolute Maximum Ratings for extended periods may affect device reliability; exceeding the ratings could cause permanent damage. The device should be operated within the limits specified under DC and AC Characteristics.

## Recommended Operating Conditions

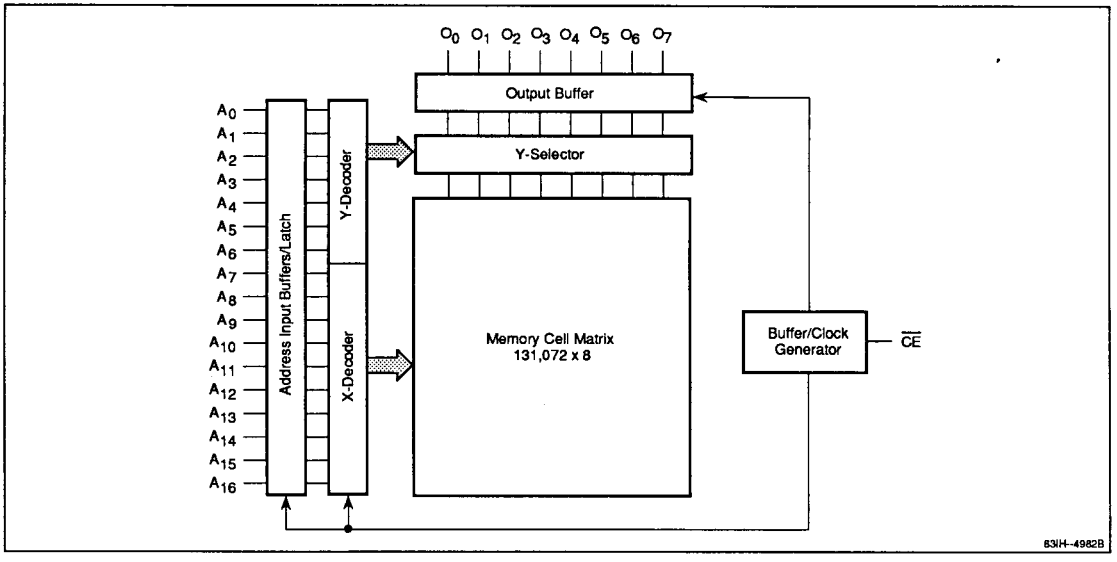
| Parameter | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Input voltage, high | $V_{IH}$ | 2.2 | | $V_{CC}$ + 0.3 | V |
| Input voltage, low | $V_{IL}$ | −0.3 | | 0.8 | V |
| Supply voltage | $V_{CC}$ | 4.5 | 5.0 | 5.5 | V |
| Ambient temperature | $T_A$ | −10 | | 70 | °C |

## Capacitance

$T_A$ = 25°C; f = 1 MHz

| Parameter | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Input capacitance | $C_I$ | | 15 | | pF |
| Output capacitance | $C_O$ | | 15 | | pF |

## Block Diagram



## DC Characteristics

$T_A$ = −10 to +70°C; $V_{CC}$ = +5.0 V ±10%

| Parameter | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Output voltage, high | $V_{OH}$ | 2.4 | | | V | $I_{OH}$ = −400 μA |
| Output voltage, low | $V_{OL}$ | | | 0.4 | V | $I_{OL}$ = +2.5 mA |
| Input leakage current | $I_{LI}$ | −10 | | 10 | μA | $V_I$ = 0 V to $V_{CC}$ |
| Output leakage current | $I_{LO}$ | −10 | | 10 | μA | $V_O$ = 0 V to $V_{CC}$; chip deselected |
| Power supply current | $I_{CC1}$ | | | 40 | mA | $\overline{CE}$ = $V_{IL}$ |
| | $I_{CC2}$ | | | 1.5 | mA | $\overline{CE}$ = $V_{IH}$ (standby) |
| | $I_{CC3}$ | | | 100 | μA | $\overline{CE}$ ≥ $V_{CC}$ − 0.2 (standby) |

## AC Characteristics

$T_A$ = −10 to +70°C; $V_{CC}$ = +5.0 V ±10% (Note 1)

| Parameter | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Address access time | $t_{ACC}$ | | | 200 | ns | |
| Chip enable access time | $t_{CE}$ | | | 200 | ns | |
| Output hold time | $t_{OH}$ | 0 | | | ns | |
| Output disable time | $t_{DF}$ | 0 | | 60 | ns | |

**Notes:**

(1) Input voltage rise and fall times = 20 ns; input and output timing reference levels = 0.8 and 2.0 V; output load = 1 TTL + 100 pF.

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## Timing Waveform