

1M BIT (128K WORD x 8 BIT) CMOS MASK ROM  
 SILICON GATE CMOS

DESCRIPTION

The TC531001CP/CF is a 1,048,576 bits read only memory organized as 131,072 words by 8 bits with a low bit cost, thus being suitable for use in program memory of micro-processor, and data memory, especially character generator. The TC531001CP/CF using CMOS technology is most suitable for low power applications where battery operations are required.

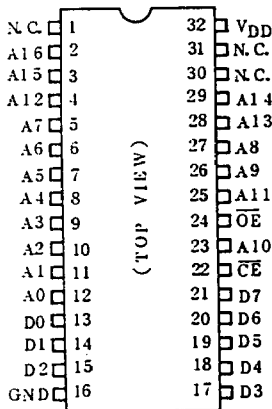
The TC531001CP/CF has one chip enable input  $\overline{CE}$  for device selection.

FEATURES

| TC531001CP/CF                              | 120ns Version | 150ns Version |
|--------------------------------------------|---------------|---------------|
| Access Time (max.)                         | 120ns         | 150ns         |
| Power Dissipation Operating Current (max.) | 40mA          | 35mA          |
| Power Dissipation Standby Current (max.)   | 20 $\mu$ A    | 20 $\mu$ A    |

- Single 5V Power Supply
- All Inputs and Outputs: TTL Compatible
- Three State Outputs
- Fully Static Operation
- Package Plastic DIP: TC531001CP  
Plastic FP : TC531001CF

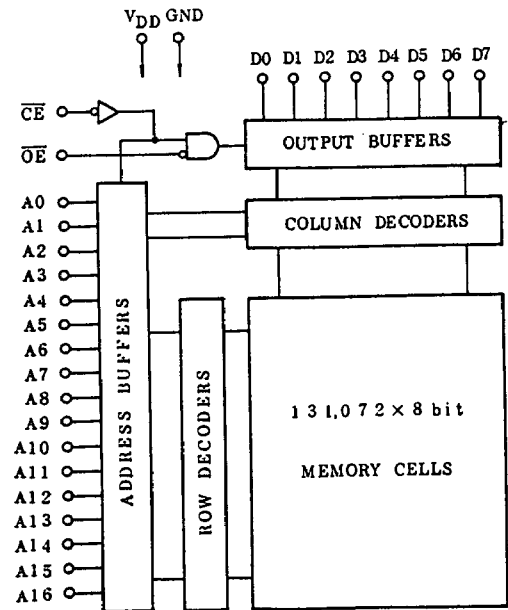
PIN CONNECTION



PIN NAMES

|                 |                     |
|-----------------|---------------------|
| A0 ~ A16        | Address Inputs      |
| D0 ~ D7         | Data Outputs        |
| $\overline{OE}$ | Output Enable Input |
| $\overline{CE}$ | Chip Enable Input   |
| VDD             | Power Supply        |
| GND             | Ground              |
| N.C.            | No Connection       |

BLOCK DIAGRAM



# TC531001CP/CF-12/15

## MAXIMUM RATINGS

| SYMBOL              | ITEM                       | RATING                 | UNIT   |
|---------------------|----------------------------|------------------------|--------|
| V <sub>DD</sub>     | Power Supply Voltage       | -0.5 ~ 7.0             | V      |
| V <sub>IN</sub>     | Input Voltage              | -0.5 ~ V <sub>DD</sub> | V      |
| V <sub>OUT</sub>    | Output Voltage             | 0 ~ V <sub>DD</sub>    | V      |
| P <sub>D</sub>      | Power Dissipation          | 1.0/0.6 *              | W      |
| T <sub>STG</sub>    | Storage Temperature        | -55 ~ 150              | °C     |
| T <sub>OPR</sub>    | Operating Temperature      | -40 ~ 70               | °C     |
| T <sub>SOLDER</sub> | Soldering Temperature Time | 260 · 10               | °C·sec |

Note: \* Plastic FP

## DC OPERATING CONDITIONS (Ta=-40~70°C)

| SYMBOL          | PARAMETER            | MIN. | TYP. | MAX.                 | UNIT |
|-----------------|----------------------|------|------|----------------------|------|
| V <sub>DD</sub> | Power Supply Voltage | 4.5  | 5.0  | 5.5                  | V    |
| V <sub>IH</sub> | Input High Voltage   | 2.2  | -    | V <sub>DD</sub> +0.3 |      |
| V <sub>IL</sub> | Input Low Voltage    | -0.3 | -    | 0.8                  |      |

## DC and OPERATING CHARACTERISTICS (Ta=-40~70°C, V<sub>DD</sub>=5V±10%)

| SYMBOL             | PARAMETER              | CONDITION                                                                  | MIN.                      | MAX. | UNIT |    |
|--------------------|------------------------|----------------------------------------------------------------------------|---------------------------|------|------|----|
| I <sub>IL</sub>    | Input Leakage Current  | V <sub>IN</sub> =0 ~ V <sub>DD</sub>                                       | -                         | ±1.0 | µA   |    |
| I <sub>LO</sub>    | Output Leakage Current | $\overline{CE}$ =V <sub>IH</sub> , V <sub>OUT</sub> =0V ~ V <sub>DD</sub>  | -                         | ±5.0 | µA   |    |
| I <sub>OH</sub>    | Output High Current    | V <sub>OH</sub> =2.4V                                                      | -1.0                      | -    | mA   |    |
| I <sub>OL</sub>    | Output Low Current     | V <sub>OL</sub> =0.4V                                                      | 3.2                       | -    | mA   |    |
| I <sub>DD</sub> S1 | Standby Current        | $\overline{CE}$ =2.2V                                                      | -                         | 2    | mA   |    |
| I <sub>DD</sub> S2 | Standby Current        | $\overline{CE}$ =V <sub>DD</sub> -0.2V                                     | -                         | 200  | µA   |    |
| I <sub>DD</sub> O1 | Operating Current      | V <sub>IN</sub> =V <sub>IH</sub> /V <sub>IL</sub><br>I <sub>OUT</sub> =0mA | t <sub>cycle</sub> =120ns | -    | 50   | mA |
|                    |                        |                                                                            | t <sub>cycle</sub> =150ns | -    | 45   |    |
| I <sub>DD</sub> O2 |                        | V <sub>IN</sub> =V <sub>DD</sub> -0.2V/0.2V<br>I <sub>OUT</sub> =0mA       | t <sub>cycle</sub> =120ns | -    | 40   |    |
|                    |                        |                                                                            | t <sub>cycle</sub> =150ns | -    | 35   |    |

## CAPACITANCE

| SYMBOL           | PARAMETER          | CONDITIONS      | MIN. | MAX. | UNIT |
|------------------|--------------------|-----------------|------|------|------|
| C <sub>IN</sub>  | Input Capacitance  | f=1MHz, Ta=25°C | -    | 10   | pF   |
| C <sub>OUT</sub> | Output Capacitance | f=1MHz, Ta=25°C | -    | 10   |      |

Note: This parameter is periodically sampled and is not 100% tested.

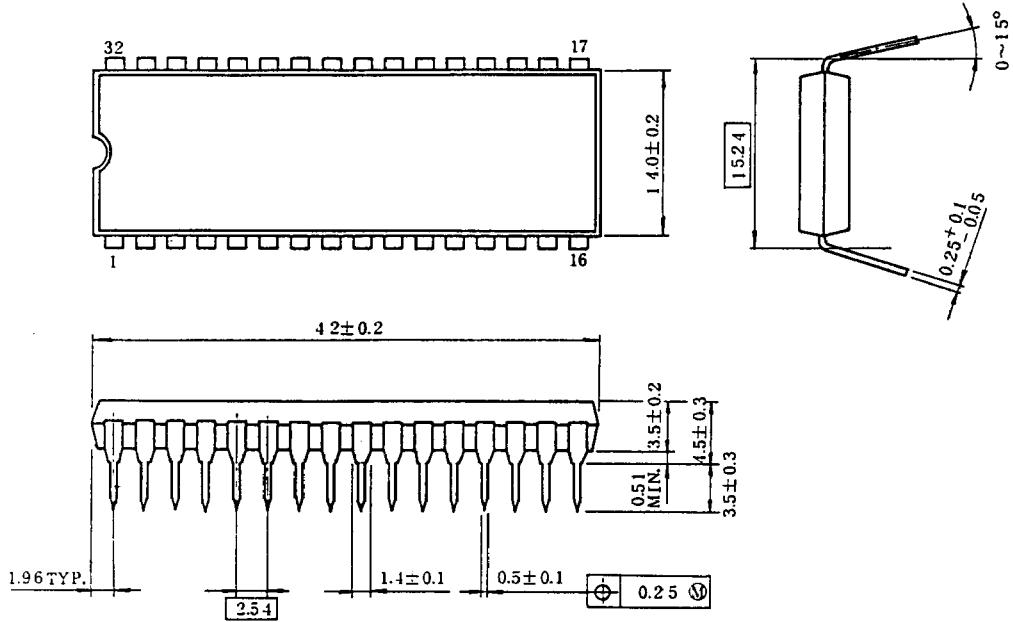


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## OUTLINE DRAWINGS

Plastic DIP (DIP32-P-600)

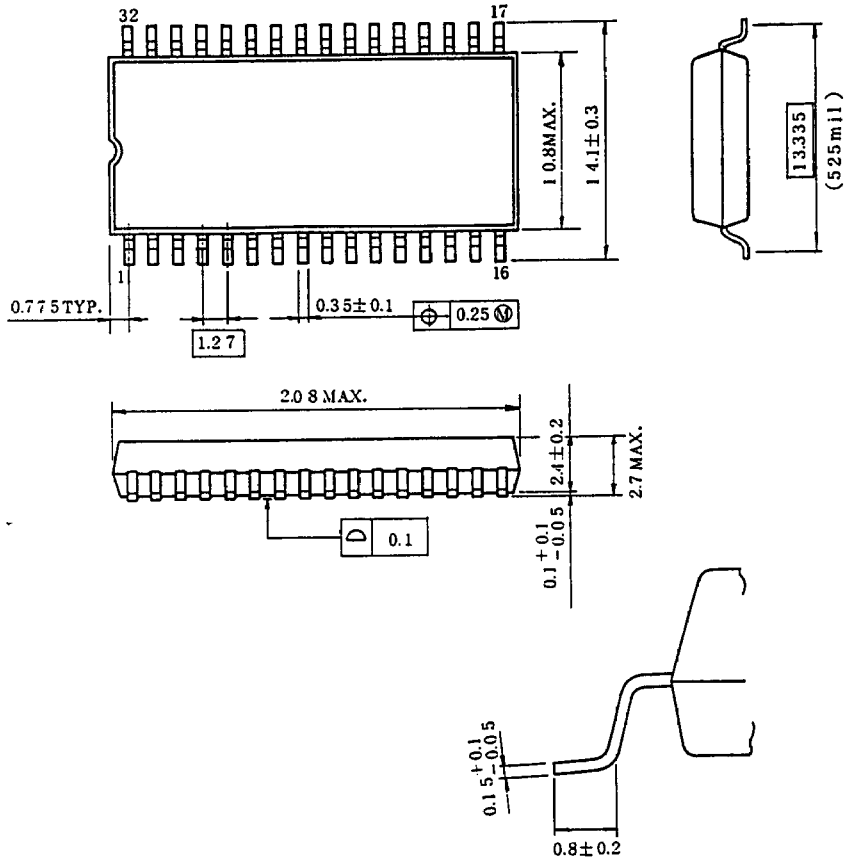
Unit in mm



Note: Package width and length do not include mold protrusion, allowable mold protrusion is 0.15mm.

Plastic FP (SOP32-P-525)

Unit in mm



Note: Package width and length do not include mold protrusion, allowable mold protrusion is 0.15mm.