TOSHIBA MOS MEMORY PRODUCT

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

TC531000AP
TC531000AF

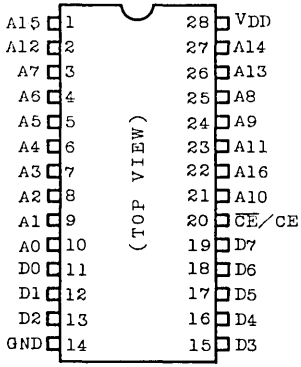
DESCRIPTION

The TC531000AP/AF 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 microprocessor, especially character generator. The TC531000AP/AF using CMOS technology is most suitable for low power applications where battery operation are required. The TC531000AP/AF has one chip enable input $\overline{CE}$/CE, programmable for device selection.

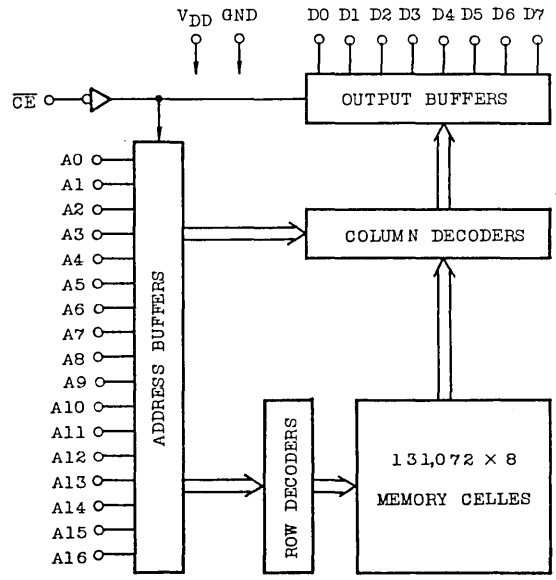
FEATURES

- Single 5V Power Supply
- Access Time: 150ns (Max.)
- Power Dissipation
  - Operating Current: 40mA (Max.)
  - Standby Current : 20μA (Max.)
- All Inputs and Outputs: TTL Compatible
- Three State Outputs
- Fully Static Operation
- Programmable Chip Enable
- Package Plastic DIP: TC531000AP
  Plastic FP : TC531000AF

PIN CONNECTION



BLOCK DIAGRAM



PIN NAMES

A0 ∿ A16	Address Inputs
D0 ∿ D7	Data Outputs
$\overline{CE}$/CE	Chip Enable Input
V_{DD}	Power Supply
GND	Ground

MAXIMUM RATINGS

SYMBOL	ITEM	RATING	UNIT
V_{DD}	Power Supply Voltage	-0.5 ∿ 7.0	V
V_{IN}	Input Voltage	-0.5 ∿ V_{DD}	V
V_{OUT}	Output Voltage	0 ∿ V_{DD}	V
P_D	Power Dissipation	1.0/0.6*	W
T_{STG}	Storage Temperature	-55 ∿ 150	°C
T_{OPR}	Operating Temperature	-40 ∿ 70	°C
T_{SOLDER}	Soldering Temperature • Time	260 • 10	°C•sec

Note: * Plastic FP

D.C. OPERATING CONDITIONS (Ta=-40 ∿ 70°C)

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_{DD}	Power Supply Voltage	4.5	5.0	5.5	V
V_{IH}	Input High Voltage	2.2	-	V_{DD}+0.3	V
V_{IL}	Input Low Voltage	-0.3	-	0.8	V

D.C. and OPERATING CHARACTERISTICS (Ta=-40 ∿ 70°C, V_{DD}=5V±10%)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{IL}	Input Leakage Current	V_{IN}=0 ∿ V_{DD}	-	±1.0	μA
I_{LO}	Output Leakage Current	$\overline{CE}$=V_{IH}, V_{OUT}=0 ∿ V_{DD}	-	±5.0	μA
I_{OH}	Output High Current	V_{OH}=2.4V	-1.0	-	mA
I_{OL}	Output Low Current	V_{OL}=0.4V	2.0	-	mA
I_{DDS1}	Standby Current	$\overline{CE}$=V_{IH}	-	2	mA
I_{DDS2}	Standby Current	$\overline{CE}$=V_{DD} and V_{IN}=0V (V_{DD})	-	20	μA
I_{DDO1}	Operating Current	V_{IN}=V_{IH}/V_{IL}, t_{cycle}=150ns	-	50	mA
I_{DDO2}		V_{IN}=V_{DD}/0V, t_{cycle}=150ns	-	40	

CAPACITANCE

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
C_{IN}	Input Capacitance	f=1MHz, Ta=25°C	-	10	pF
C_{OUT}	Output Capacitance	f=1MHz, Ta=25°C	-	10	

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

A.C. CHARACTERISTICS (V_{DD}=5V±10%, Ta=-40 ∿ 70°C)

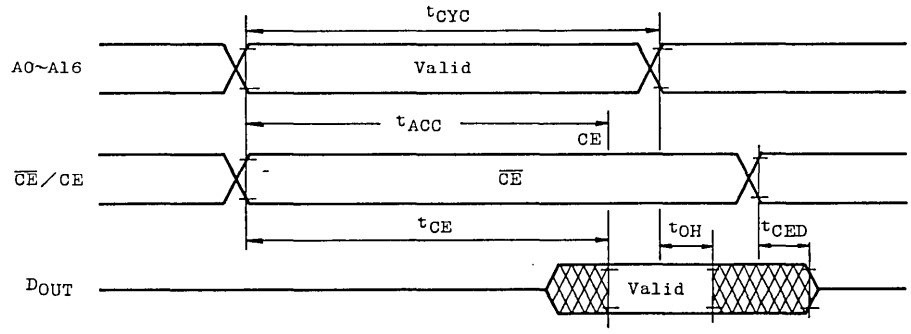
SYMBOL	PARAMETER	MIN.	MAX.	UNIT
t_{CYC}	Cycle Time	150	-	ns
t_{ACC}	Access Time	-	150	ns
t_{CE}	Chip Enable Access Time	-	150	ns
t_{CED}	Output Disable Time	-	50	ns
t_{OH}	Output Hold Time	0	-	ns

AC TEST CONDITIONS

- Output Load : 100pF + 1TTL
- Input Levels : 0.6V, 2.4V
- Timing Measurement Reference Levels

  Input : 0.8V, 2.2V
  Output: 0.8V, 2.0V
- Input Rise and Fall Time : 5ns

TIMING WAVEFORMS



OPERATION MODE

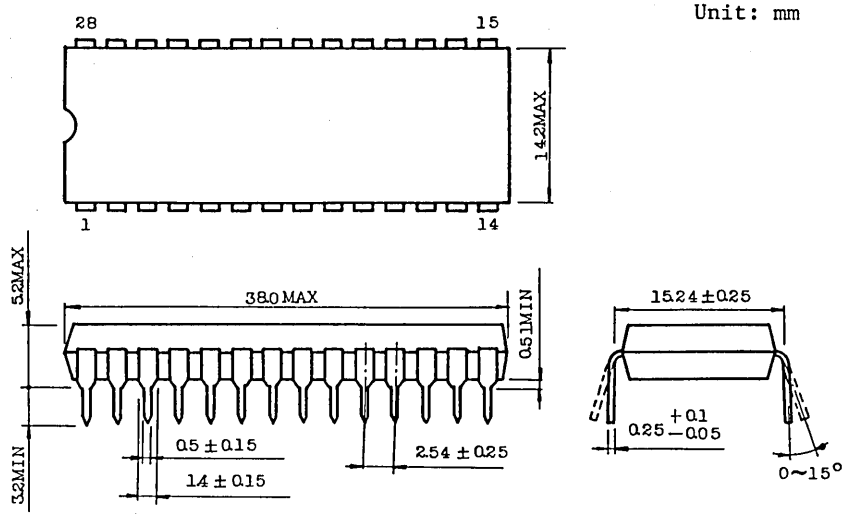
MODE	$\overline{CE}$(CE)	A0 ∿ 16	Outputs	Power
Read	L(H)	Valid	Data Out	Operating
Output Deselect	H(L)	*	High-Z	Standby

H: V_{IH}, L: V_{IL}, *: V_{IH} or V_{IL}

OUTLINE DRAWINGS

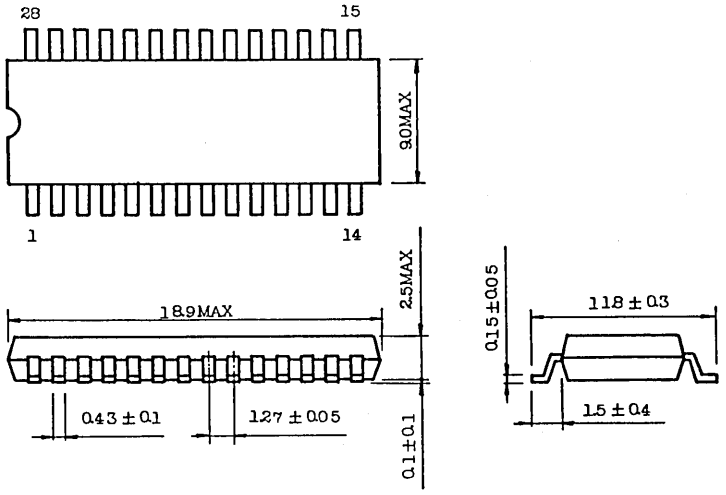
Plastic DIP

Unit: mm



Note: Each lead pitch is 2.54mm.
All leads are located within 0.25mm of their true longitudinal position with respect to No.1 and No.28 leads.

Plastic FP



Note: Each lead pitch is 1.27mm.
All leads are located within 0.25mm of their true longitudinal position with respect to No.1 and No.28 leads.