TOSHIBA MOS INTEGRATED CIRCUIT SILICON GATE CMOS

4 MBIT (512 K WORD BY 8 BITS) CMOS MASK ROM

DESCRIPTION

The TC534000CP/CF is a 4,194,304-bit Read Only Memory organized as 524,288 words by 8 bits.

The TC534000CP/CF is fabricated using Toshiba's advanced CMOS technology which provides the high speed and low power features, an access time of 120 ns, an operation current of 60 mA at 8.3 MHz and a standby current of 100 μA.

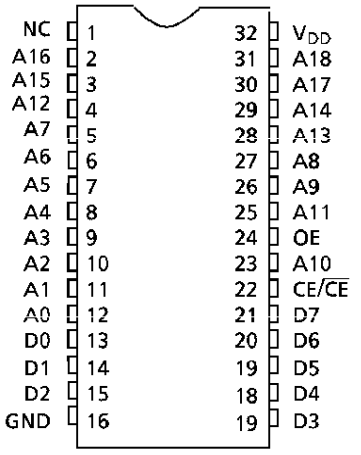
The TC534000CP/CF has one programmable Chip Enable input $\overline{CE}$/CE for device selection.

The TC534000CP/CF is packaged in a standard 600 mil 32-pin DIP or 525 mil 32-pin SOP.

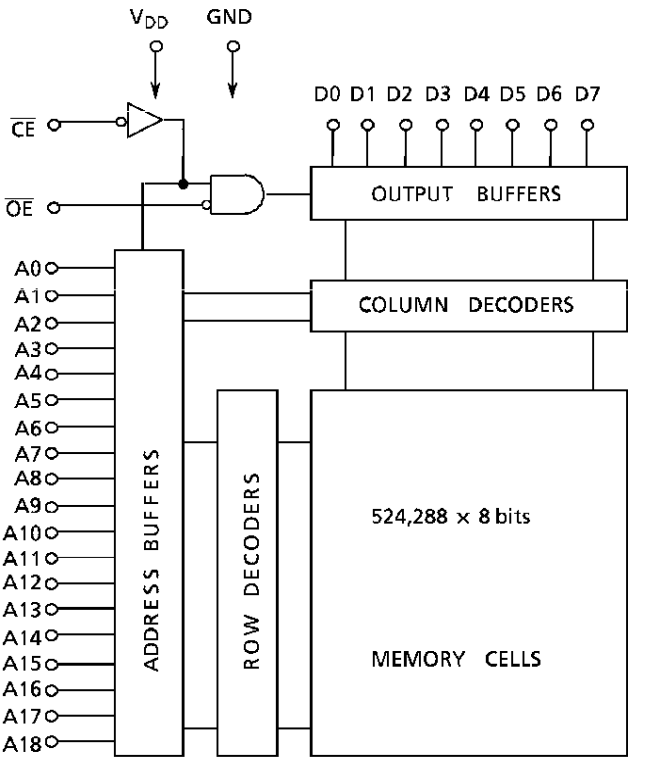
FEATURES

- Single 5 V Power Supply
- Access Time: 120 ns (max) $V_{DD} = 5\ V \pm 10\%$
- Power Dissipation
  - Operating Current: 60 mA (max)
  - Standby Current : 100 μA (max)
- All Inputs and Outputs: TTL Compatible
- Three State Outputs
- Fully Static Operation
- Programmable Chip Enable
- TC534000CP: DIP32−P−600
  TC534000CF: SOP32−P−525

PIN ASSIGNMENT



BLOCK DIAGRAM



PIN NAMES

A0 to A18	Address Inputs
D0 to D7	Data Outputs
$\overline{OE}$	Output Enable Input
CE/$\overline{CE}$	Chip Enable Input
V_{DD}	Power Supply
GND	Ground
NC	No Connection

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ABSOLUTE MAXIMUM RATINGS

SYMBOL	RATING	VALUE	UNIT
V_{DD}	Power Supply Voltage	− 0.5 to 7.0	V
V_{IN}	Input Voltage	− 0.5 to V_{DD}	V
V_{OUT}	Output Voltage	0 to V_{DD}	V
P_D	Power Dissipation	1.0/0.6*	W
T_{STG}	Storage Temperature	− 55 to 150	°C
T_{OPR}	Operating Temperature	0 to 70	°C
T_{SOLDER}	Soldering Temperature (10 s)	260	°C

Note: * Plastic SOP

DC RECOMMENDED OPERATING CONDITIONS (Ta = 0° to 70°C)

SYMBOL	PARAMETER	MIN	MAX	UNIT
V_{DD}	Power Supply Voltage	4.5	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

DC CHARACTERISTICS (V_{DD} = 5 V ± 10%, Ta = 0° to 70°C)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
I_{IL}	Input Leakage Current	V_{IN} = 0 to V_{DD}	−	± 1.0	μA
I_{LO}	Output Leakage Current	$\overline{CE}$ = V_{IH}, V_{OUT} = 0 to V_{DD}	−	± 1.0	μA
I_{OH}	Output High Current	V_{OH} = 2.4 V	− 1.0	−	mA
I_{OL}	Output Low Current	V_{OL} = 0.4 V	2.0	−	mA
I_{DDS1}	Standby Current	$\overline{CE}$ = V_{IH}	−	2	mA
I_{DDS2}		$\overline{CE}$ = V_{DD} and V_{IN} = 0 V (V_{DD})	−	100	μA
I_{DDO1}	Operating Current	V_{IN} = V_{IH}/V_{IL}, t_{cyc} = 120 ns	−	65	mA
I_{DDO2}		V_{IN} = V_{DD}/0 V, t_{cyc} = 120 ns	−	60	mA
I_{DDO3}		V_{IN} = V_{IH}/V_{IL}, t_{cyc} = 150 ns	−	45	mA
I_{DDO4}		V_{IN} = V_{DD}/0 V, t_{cyc} = 150 ns	−	40	mA

CAPACITANCE

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

Note: This parameter is periodically sampled and is not tested for every component.

AC CHARACTERISTICS AND OPERATING CONDITIONS

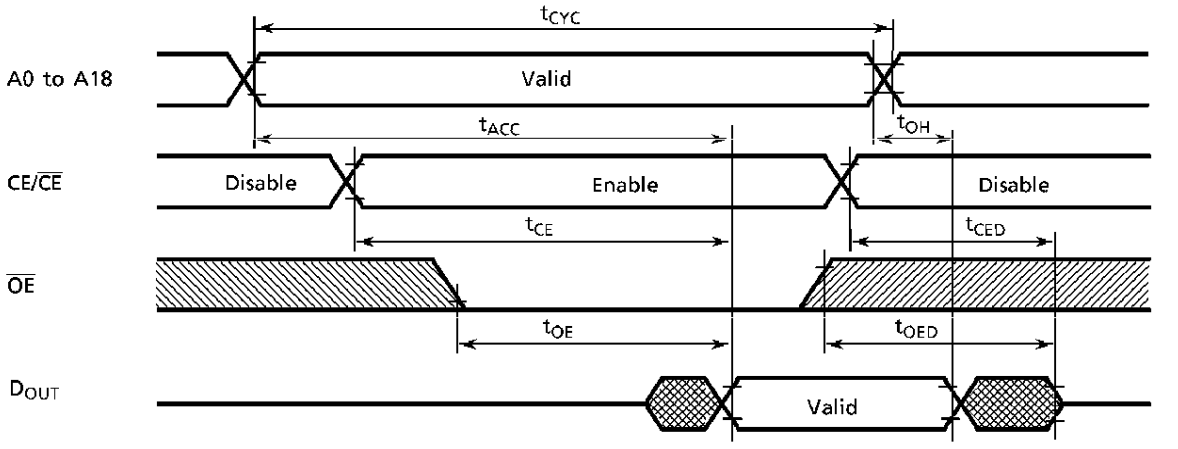
(V_{DD} = 5 V ± 10%, Ta = 0° to 70°C)

SYMBOL	PARAMETER	MIN	MAX	UNIT
t_{ACC}	Access Time	–	120	ns
t_{CE}	Chip Enable Access Time	–	120	ns
t_{OE}	Output Enable Access Time	–	55	ns
t_{CED}	Output Disable Time from $\overline{CE}$	0	35	ns
t_{OED}	Output Disable Time from $\overline{OE}$	0	35	ns
t_{OH}	Output Hold Time	5	–	ns
t_{CYC}	Cycle Time	120	–	ns

AC TEST CONDITIONS

Output Load	: 100 pF + 1 TTL
Input Levels	: 0.6 V, 2.4 V
Timing Measurement Reference Levels	Input : 0.8 V, 2.2 V
	Output: 0.8 V, 2.0 V
Input Rise and Fall Time	: 5 ns

TIMING DIAGRAMS



OPERATION MODES

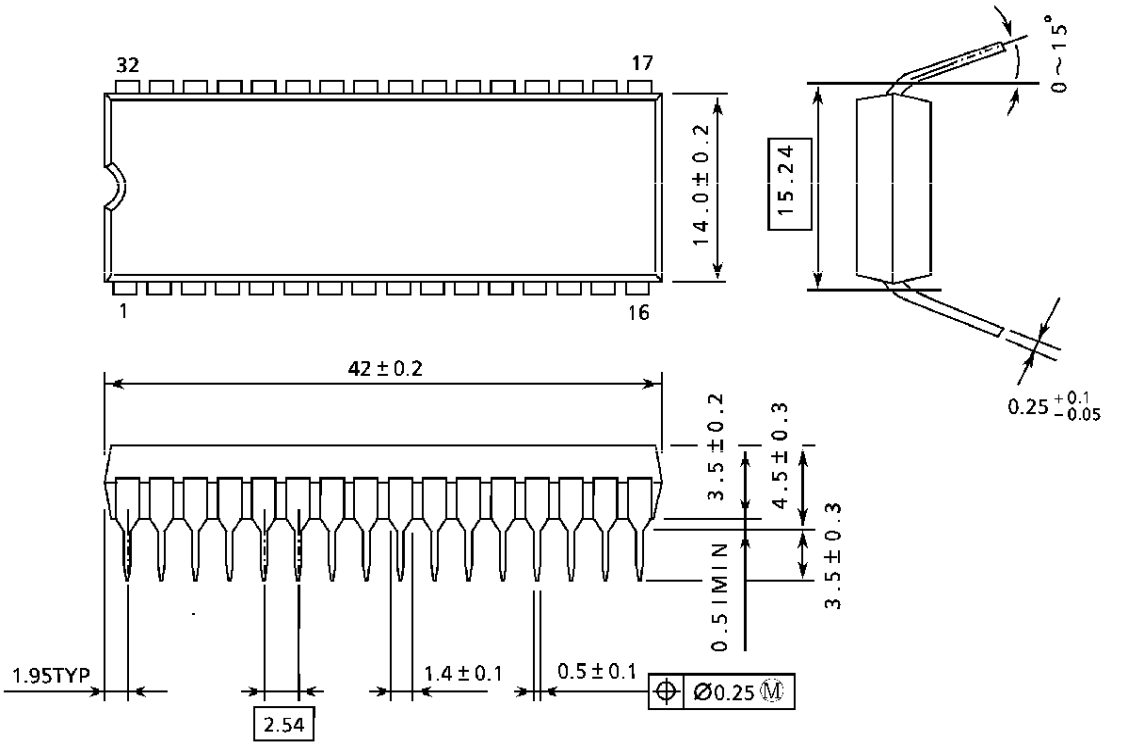
MODE	$\overline{CE}$ (CE)	$\overline{OE}$	A0 TO A18	OUTPUTS	POWER
Read	L (H)	L	Valid	Data Out	Operating
Standby	H (L)	*	*	High-Z	Standby
Output Deselect	L (H)	H	*	High-Z	Operating

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

PACKAGE DIMENSIONS

Plastic DIP (DIP32−P−600−2.54)

UNITS: mm

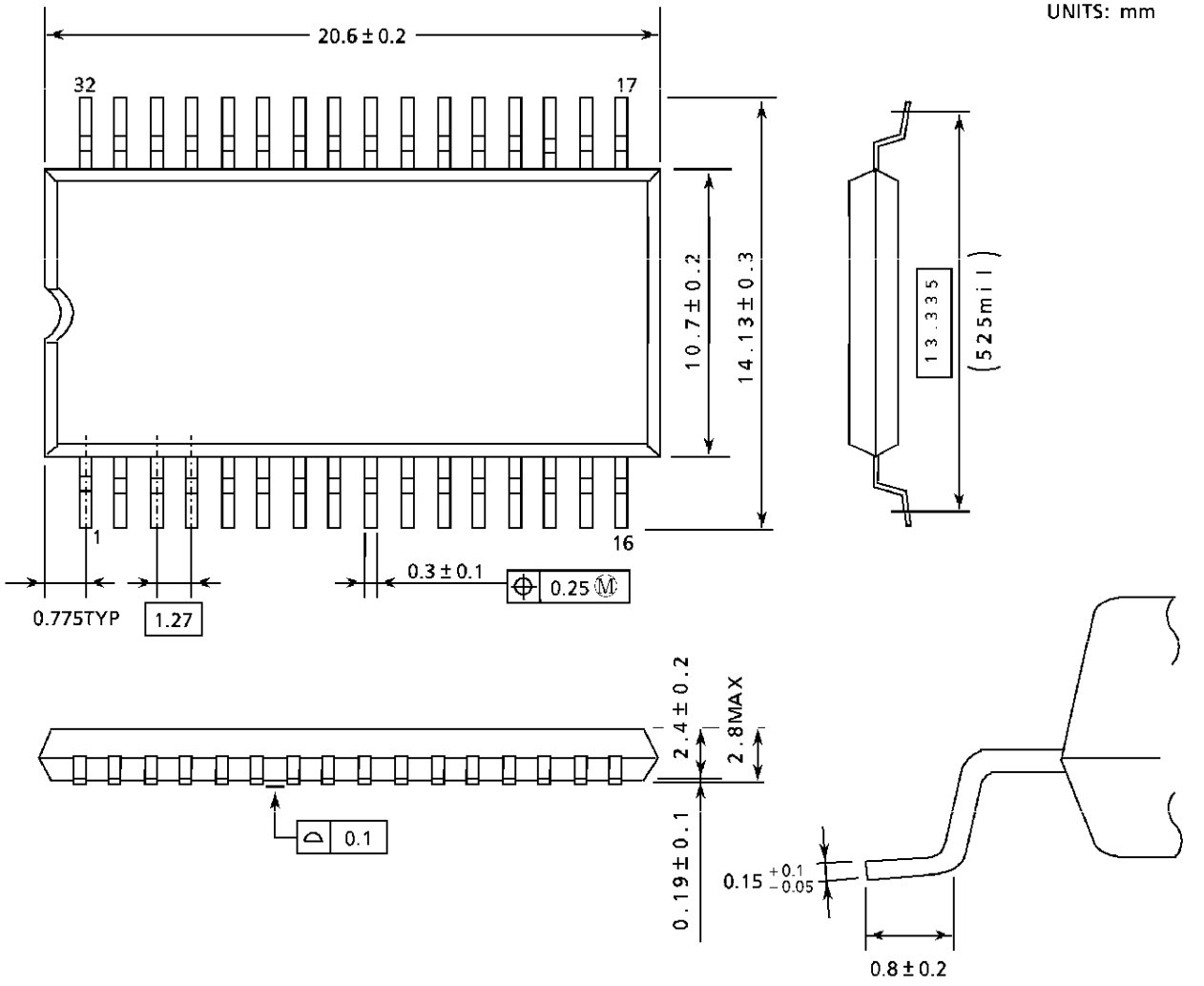


Weight: 4.5 g (typ)

Note: Package width and length do not include mold protrusion. The permissible mold protrusion is 0.15 mm.

PACKAGE DIMENSIONS
Plastic FP (SOP32−P−525−1.27)

UNITS: mm



Weight: 1.1 g (typ)

Note: Package width and length do not include mold protrusion. The permissible mold protrusion is 0.15 mm.