

**4 MBIT (256 K WORD BY 16 BITS/512 K WORD BY 8 BITS) CMOS MASK ROM**

**DESCRIPTION**

The TC534200CP/CF is a 4,194,304-bit Read Only Memory organized as 262,144 words by 16 bits when  $\overline{\text{BYTE}}$  is logical high, and as 524,288 words by 8 bits when  $\overline{\text{BYTE}}$  is logical low.

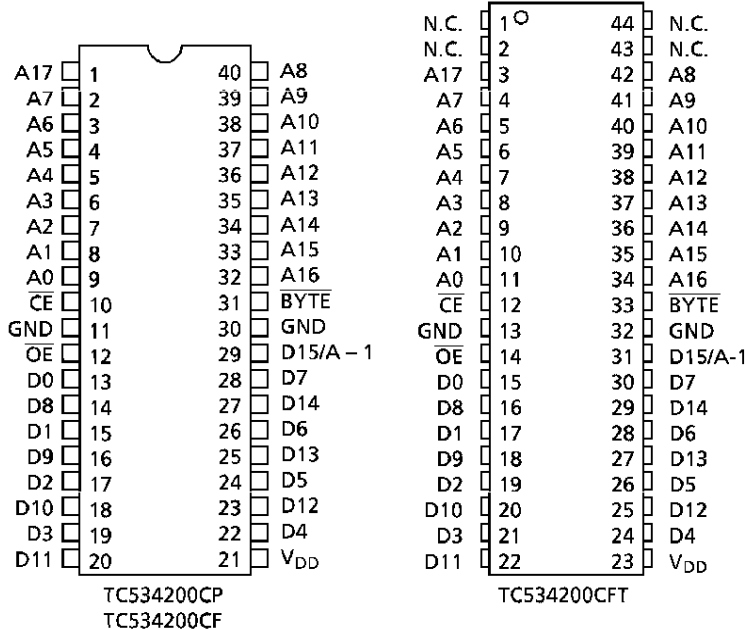
The TC534200CP/CF is most suitable for application such as program memory, data memory fast high speed from, and character generators.

The TC534200CP/CF is packaged in a standard 600 mil 40-pin DIP or 525 mil 40-pin SOP or 400 mil 44-pin TSOP Type II.

**FEATURES**

- Single 5 V Power Supply
- Access Time: 120 ns (max)
- Power Dissipation
  - Operating Current: 75 mA (max)
  - Standby Current : 100  $\mu\text{A}$  (max)
- Fully Static Operation
- All Inputs and Outputs: TTL Compatible
- Three State Outputs
- TC534200CP: DIP40 – P – 600
- TC534200CF: SOP40 – P – 525
- TC534200CFT: TSOP44 – P – 400

**PIN ASSIGNMENT (TOP VIEW)**



**PIN NAMES**

A0 to A17	Address Inputs
D0 to D14	Data Outputs
$\overline{\text{CE}}$	Chip Enable Input
$\overline{\text{OE}}$	Output Enable Input
D15/A – 1	Data Output/Address Input
$\overline{\text{BYTE}}$	Word, Byte Selection Input
$V_{\text{DD}}$	Power Supply
GND	Ground

961001EBA2

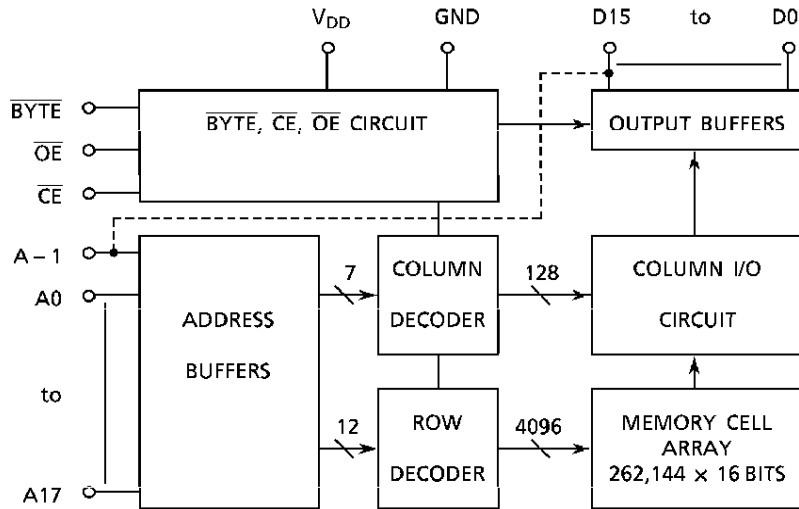
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**BLOCK DIAGRAM**



**MODE SELECTION**

MODE	$\overline{CE}$	$\overline{OE}$	BYTE	D0 TO D7	D8 TO D14	D15/A - 1	POWER
Read (16-Bit)	L	L	H	Data Out			Active
Read (8-Bit)	L	L	L	Data Out (Lower 8 bits)	High Impedance	L	Active
Read (8-Bit)	L	L	L	Data Out (Upper 8 bits)	High Impedance	H	Active
Output Deselect	L	H	*	High Impedance			Active
Standby	H	*	*	High Impedance			Standby

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

**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

\* SOP/TSOP

## DC RECOMMENDED OPERATING CONDITIONS (Ta = 0° to 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
V <sub>IL</sub>	Input Low Voltage	- 0.3	-	0.8	V

## DC CHARACTERISTICS (Ta = 0° to 70°C)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
I <sub>IL</sub>	Input Leakage Current	V <sub>IN</sub> = 0 to V <sub>DD</sub>	-	± 1.0	μA
I <sub>LO</sub>	Output Leakage Current	V <sub>OUT</sub> = 0 to V <sub>DD</sub>	-	± 5.0	μA
I <sub>OH</sub>	Output High Current	V <sub>OH</sub> = 2.4 V	- 1.0	-	mA
I <sub>OL</sub>	Output Low Current	V <sub>OL</sub> = 0.4 V	2.0	-	mA
I <sub>DD51</sub>	Standby Current	$\overline{CE} = V_{IH}$	-	2	mA
I <sub>DD52</sub>		$\overline{CE} = V_{DD} - 0.2 V$	-	100	μA
I <sub>DDO1</sub>	Operating Current	V <sub>IN</sub> = V <sub>IH</sub> /V <sub>IL</sub> , t <sub>cycle</sub> = 120 ns	-	80	mA
I <sub>DDO2</sub>		V <sub>IN</sub> = V <sub>DD</sub> - 0.2 V/0.2 V, t <sub>cycle</sub> = 120 ns	-	75	mA
I <sub>DDO3</sub>		V <sub>IN</sub> = V <sub>IH</sub> /V <sub>IL</sub> , t <sub>cycle</sub> = 150 ns	-	60	mA
I <sub>DDO4</sub>		V <sub>IN</sub> = V <sub>DD</sub> - 0.2 V/0.2 V, t <sub>cycle</sub> = 150 ns	-	50	mA

## CAPACITANCE (f = 1 MHz, Ta = 25°C)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
C <sub>IN</sub>	Input Capacitance	V <sub>IN</sub> = 0 V	-	10	pF
C <sub>OUT</sub>	Output Capacitance	V <sub>OUT</sub> = 0 V	-	12	pF

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

**AC CHARACTERISTICS AND OPERATING CONDITIONS**

( $T_a = 0^\circ$  to  $70^\circ\text{C}$ ,  $V_{DD} = 5\text{ V} \pm 10\%$ )

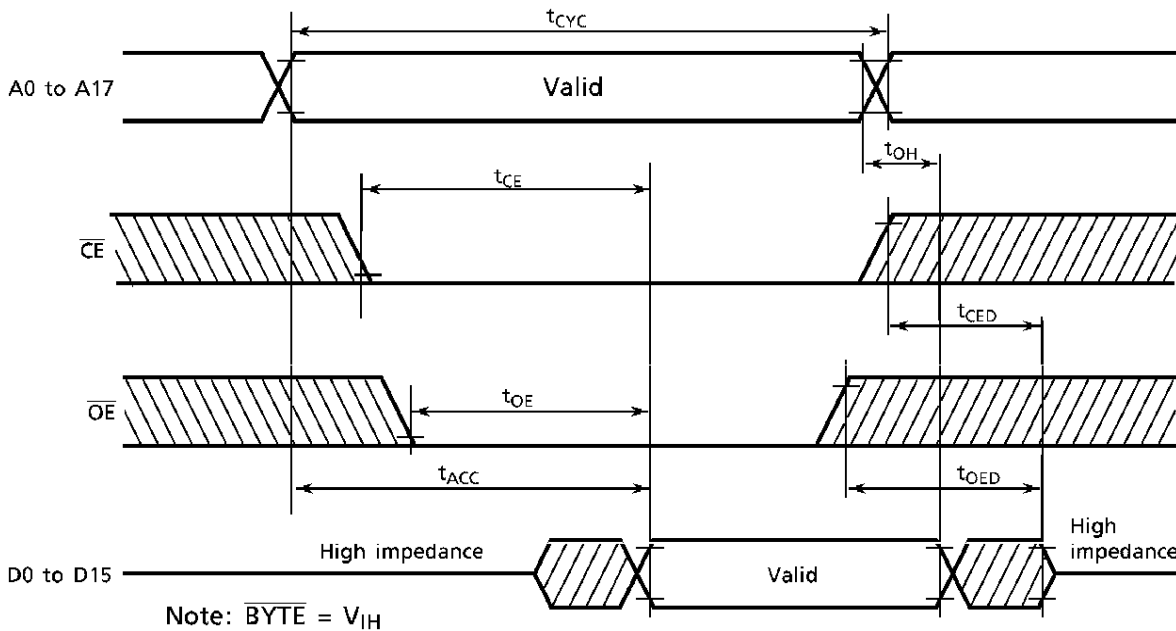
SYMBOL	PARAMETER	MIN	MAX	UNIT
$t_{CYC}$	Cycle Time	120	–	ns
$t_{ACC}$	Address Access Time	–	120	ns
$t_{CE}$	Chip Enable Access Time	–	120	ns
$t_{BT}$	BYTE Access Time	–	120	ns
$t_{OE}$	Output Enable Access Time	–	55	ns
$t_{CED}$	Output Disable Time from $\overline{CE}$	–	35	ns
$t_{OED}$	Output Disable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

**AC TEST CONDITIONS**

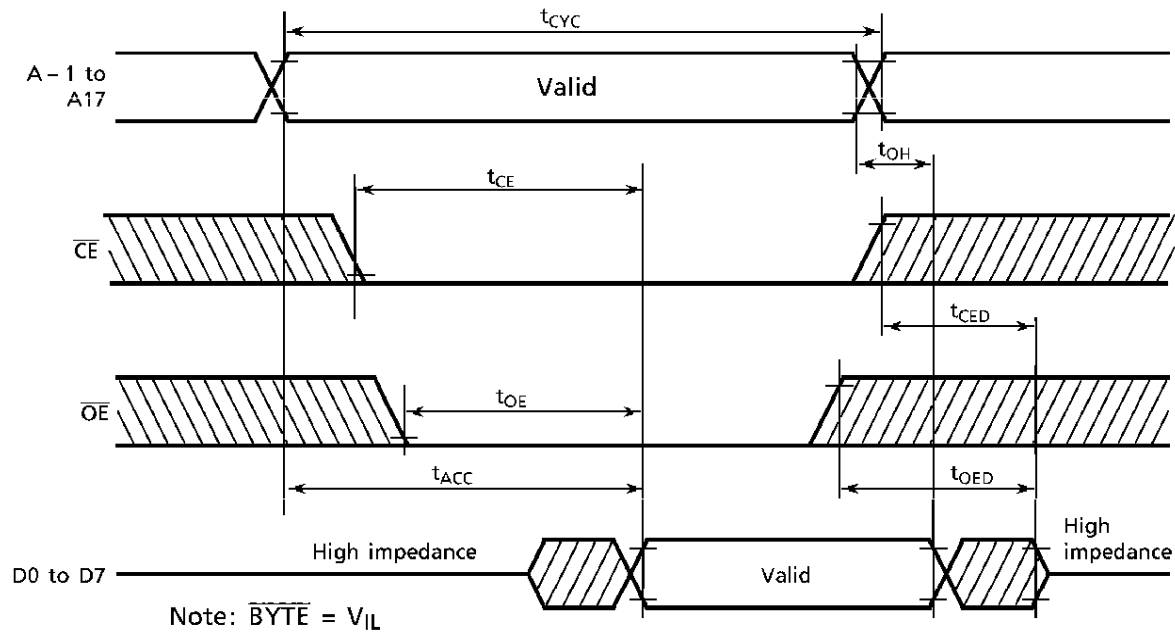
Output Load : 100 pF + 1 TTL  
 Input Levels : 0.6 V, 2.4 V  
 Timing Measurement Reference Levels Input : 0.8 V, 2.2 V  
 Output: 0.8 V, 2.0 V  
 Input Rise and Fall Time : 5 ns

**TIMING DIAGRAMS**

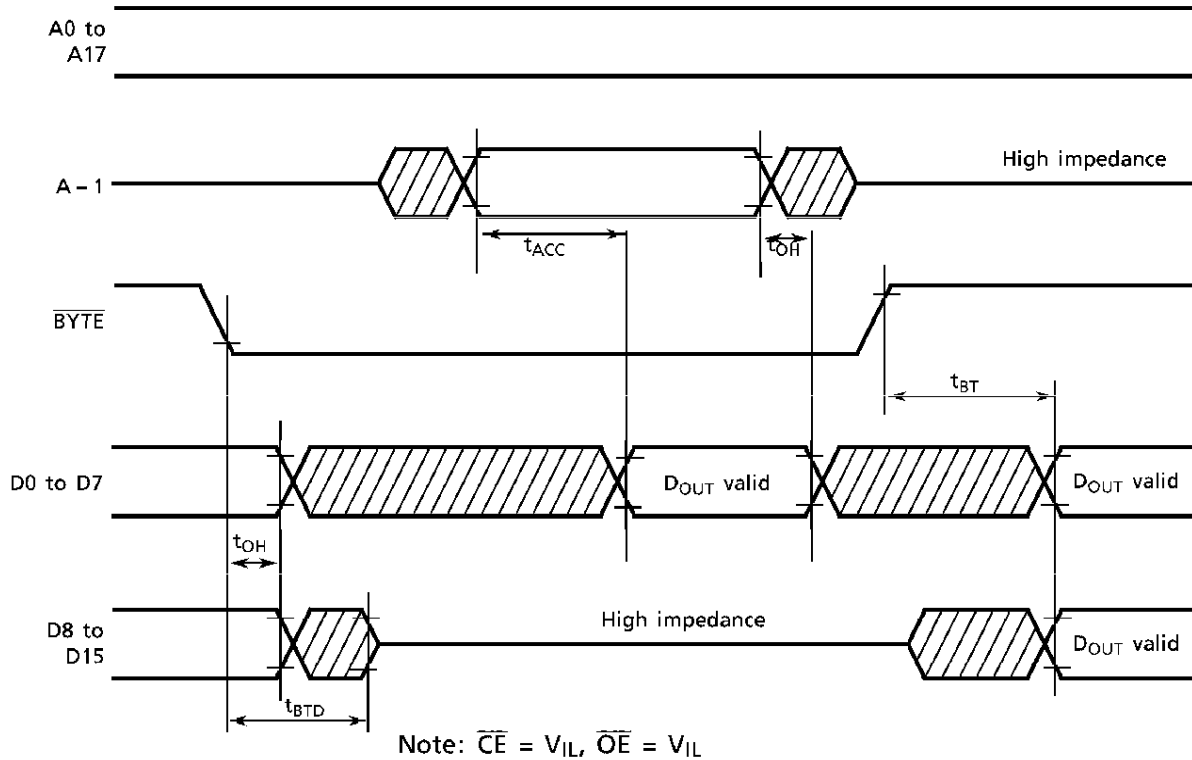
**WORD-WIDE READ MODE**



BYTE-WIDE READ MODE



BYTE TRANSITION

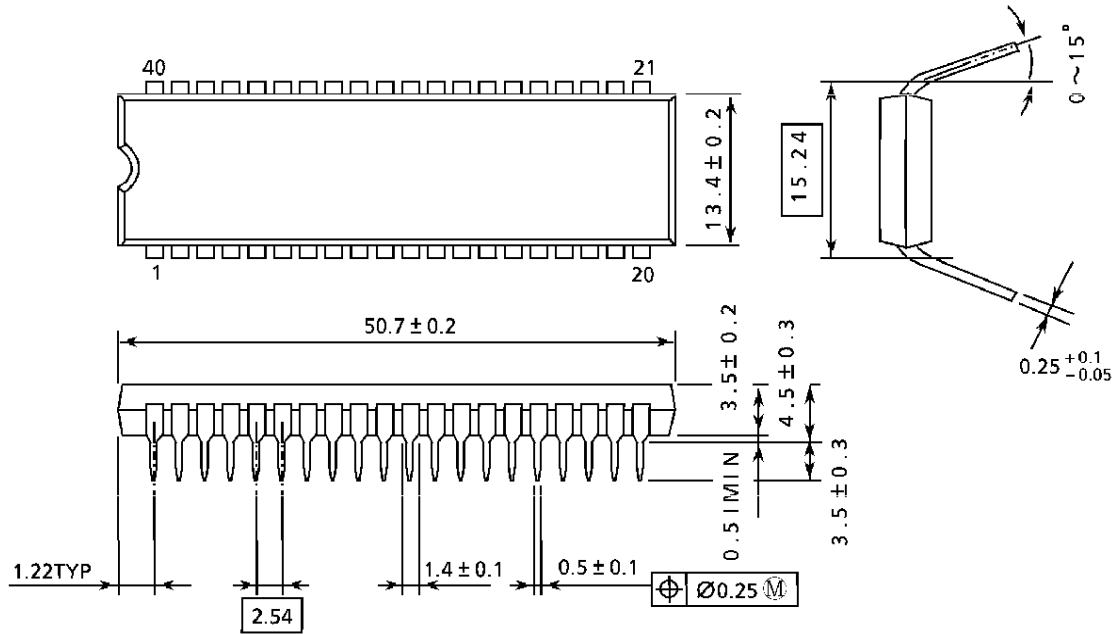


PACKAGE DIMENSIONS

- Plastic DIP

DIP40 – P – 600 – 2.54

UNITS: mm



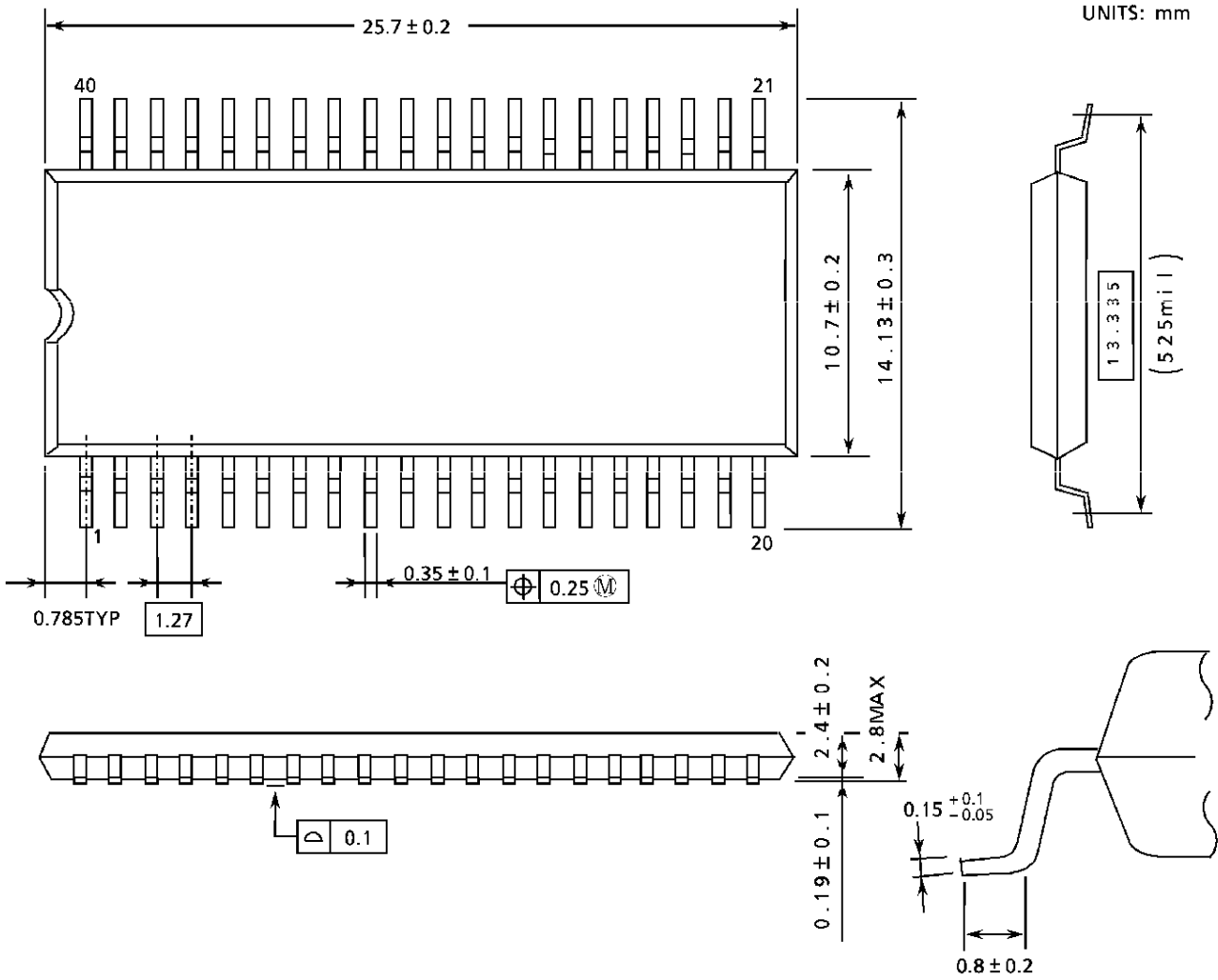
Weight: 5.3 g (typ)

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

PACKAGE DIMENSIONS

- Plastic SOP

SOP40-P-525-1.27

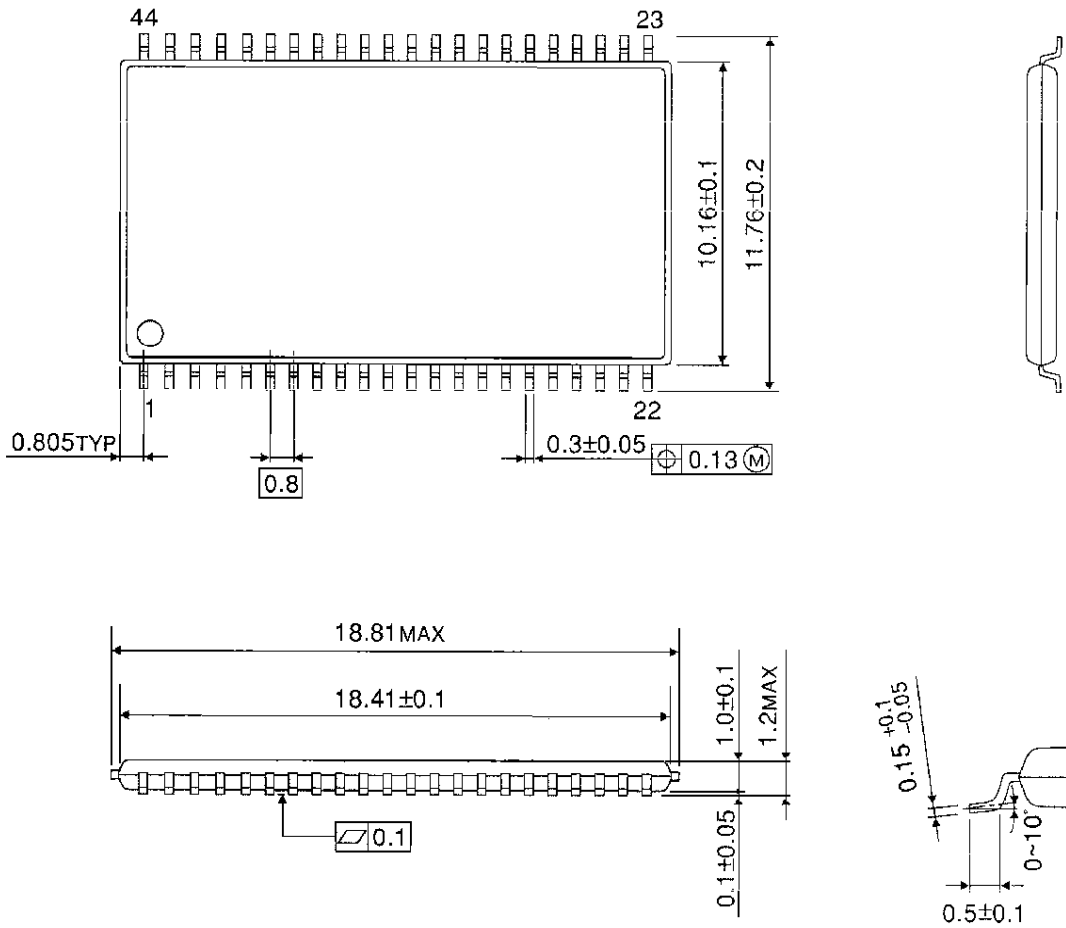


Weight: 1.3 g (typ)

PACKAGE DIMENSIONS

- TC534200CFT

TSOP44 II -P-400-0.80



Weight : 0.5g (Typ)

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