

16 MBIT (1 M WORD BY 16 BITS/2 M WORD BY 8 BITS) CMOS MASK ROM

DESCRIPTION

The TC5316200CP/CF/CFT is a 16,777,216-bit Read Only Memory organized as 1,048,576 words by 16 bits when BYTE is logical high, and as 2,097,152 words by 8 bits when BYTE is logical low.

The TC5316200CP/CF/CFT is most suitable for application such as program memory, data memory, and character generators.

The TC5316200CP/CF/CFT is packaged in a standard 600 mil 42-pin DIP, or 600 mil 44-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: 80 mA (max)
 - Standby Current : 100 μ A (max)
- Fully Static Operation
- All Inputs and Outputs: TTL Compatible
- Three State Outputs
- TC5316200CP : DIP42-P-600
- TC5316200CF : SOP44-P-600
- TC5316200CFT: TSOP44-P-400

PIN ASSIGNMENT (TOP VIEW)

A18	1	42	A19	NC	1	44	NC
A17	2	41	A8	A18	2	43	A19
A7	3	40	A9	A17	3	42	A8
A6	4	39	A10	A7	4	41	A9
A5	5	38	A11	A6	5	40	A10
A4	6	37	A12	A5	6	39	A11
A3	7	36	A13	A4	7	38	A12
A2	8	35	A14	A3	8	37	A13
A1	9	34	A15	A2	9	36	A14
A0	10	33	A16	A1	10	35	A15
CE	11	32	BYTE	A0	11	34	A16
GND	12	31	GND	CE	12	33	BYTE
OE	13	30	D15/A - 1	GND	13	32	GND
D0	14	29	D7	OE	14	31	D15/A - 1
D8	15	28	D14	D0	15	30	D7
D1	16	27	D6	D8	16	29	D14
D9	17	26	D13	D1	17	28	D6
D2	18	25	D5	D9	18	27	D13
D10	19	24	D12	D2	19	26	D5
D3	20	23	D4	D10	20	25	D12
D11	21	22	V _{DD}	D3	21	24	D4

TC5316200CP

TC5316200CF

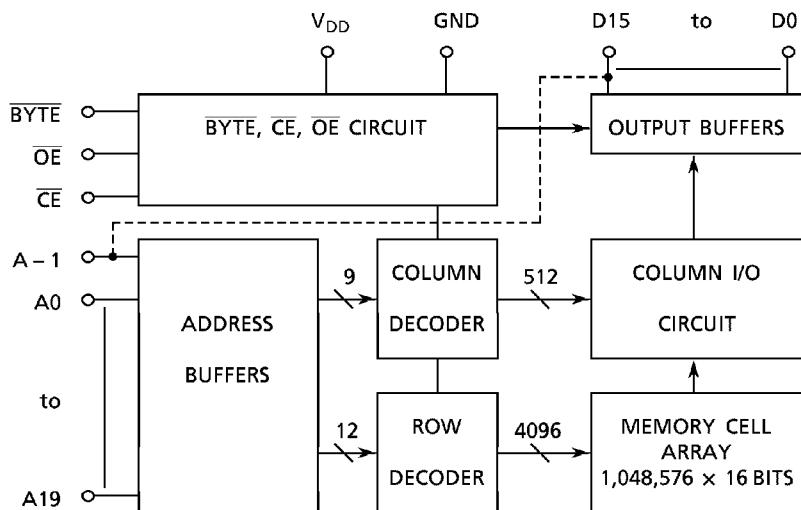
TC5316200CFT

PIN NAMES

A0 to A19	Address Inputs
D0 to D14	Data Outputs
CE	Chip Enable Input
OE	Output Enable Input
D15/A - 1	Data Output/Address Input
BYTE	Word, Byte Selection Input
V _{DD}	Power Supply
GND	Ground
NC	No Connection

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BLOCK DIAGRAM



MODE SELECTION

MODE	CE	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 _{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

DC CHARACTERISTICS (Ta = 0° to 70°C)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
I _{IL}	Input Leakage Current	V _{IN} = 0 to V _{DD}	-	± 5.0	µA
I _{LO}	Output Leakage Current	V _{OUT} = 0 to V _{DD}	-	± 5.0	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	CE = V _{IH}	-	2	mA
I _{DDS2}		CE = V _{DD} - 0.2 V	-	100	µA
I _{DDO1}	Operating Current	V _{IN} = V _{IH} /V _{IL} , t _{cycle} = 120 ns I _{OUT} = 0 mA	-	90	mA
I _{DDO1}		V _{IN} = V _{IH} /V _{IL} , t _{cycle} = 150 ns I _{OUT} = 0 mA	-	80	mA
I _{DDO2}		V _{IN} = V _{DD} - 0.2 V/0.2 V t _{cycle} = 120 ns, I _{OUT} = 0 mA	-	80	mA
I _{DDO2}		V _{IN} = V _{DD} - 0.2 V/0.2 V t _{cycle} = 150 ns, I _{OUT} = 0 mA	-	70	mA

CAPACITANCE (f = 1 MHz, Ta = 25°C)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
C _{IN}	Input Capacitance	V _{IN} = 0 V	-	10	pF
C _{OUT}	Output Capacitance	V _{OUT} = 0 V	-	12	pF

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

AC CHARACTERISTICS AND OPERATING CONDITIONS

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

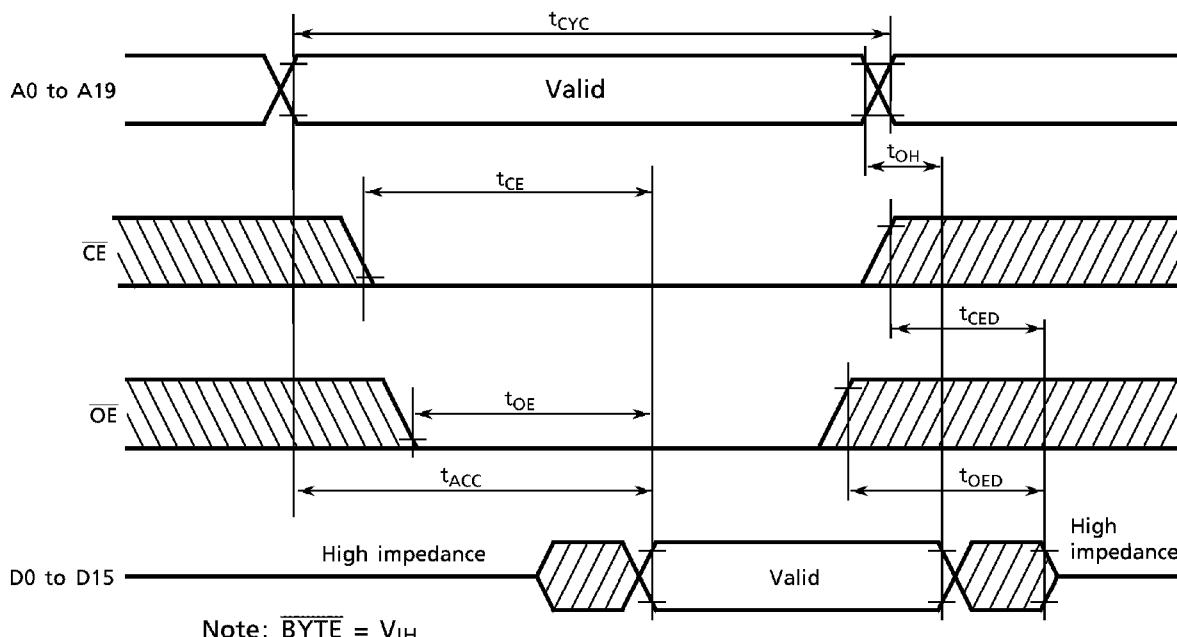
SYMBOL	PARAMETER	MIN	MAX	UNIT
t_{CYC}	Cycle Time	120	-	ns
t_{ACC}	Address Access Time	-	120	ns
t_{CE}	Chip Enable Access Time	-	120	ns
t_{BT}	BYTE Access Time	-	120	ns
t_{OE}	Output Enable Access Time	-	60	ns
t_{CED}	Output Disable Time from \overline{CE}	-	45	ns
t_{OED}	Output Disable Time from \overline{OE}	-	45	ns
t_{BTD}	Output Disable Time from BYTE	-	45	ns
t_{OH}	Output Hold Time	5	-	ns

AC TEST CONDITIONS

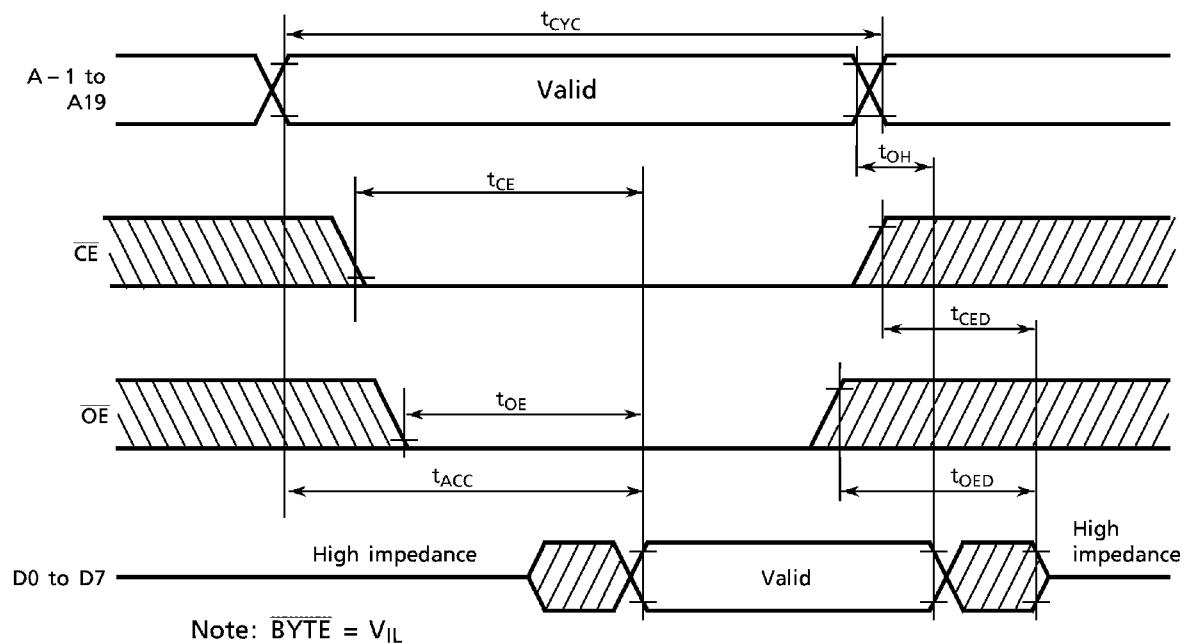
Output Load : 100 pF + 1 TTL
 Input Levels : 0.6 V, 2.4 V
 Timing Measurement Reference Levels
 Input : 0.8 V, 2.2 V
 Output: 0.8 V, 2.0 V
 Input Rise and Fall Time : 5 ns

TIMING DIAGRAMS

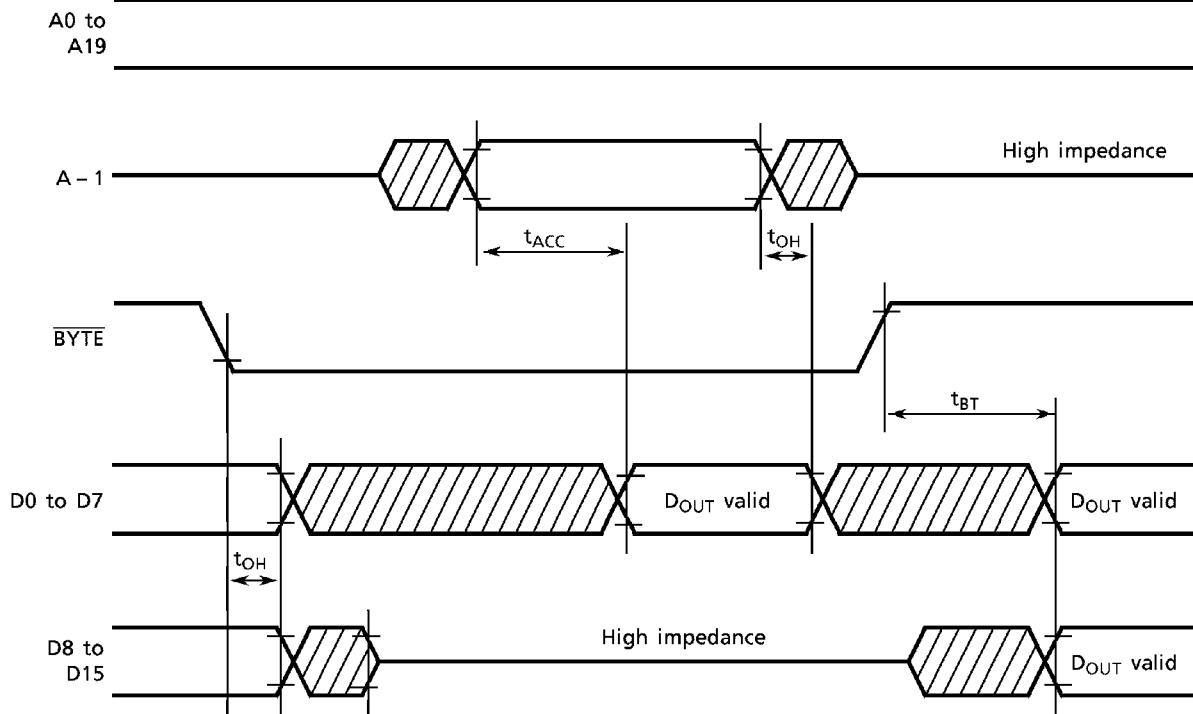
WORD-WIDE READ MODE



BYTE-WIDE READ MODE



BYTE TRANSITION



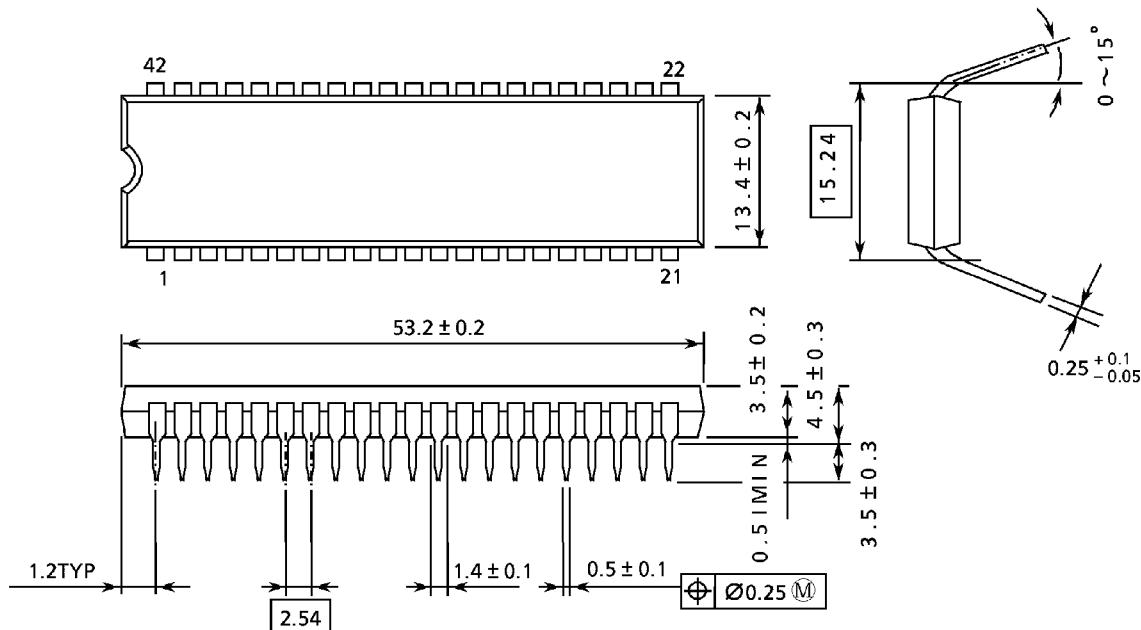
Note: $\overline{\text{CE}} = V_{IL}$, $\overline{\text{OE}} = V_{IL}$

PACKAGE DIMENSIONS

- Plastic DIP

DIP42-P-600

UNITS: mm



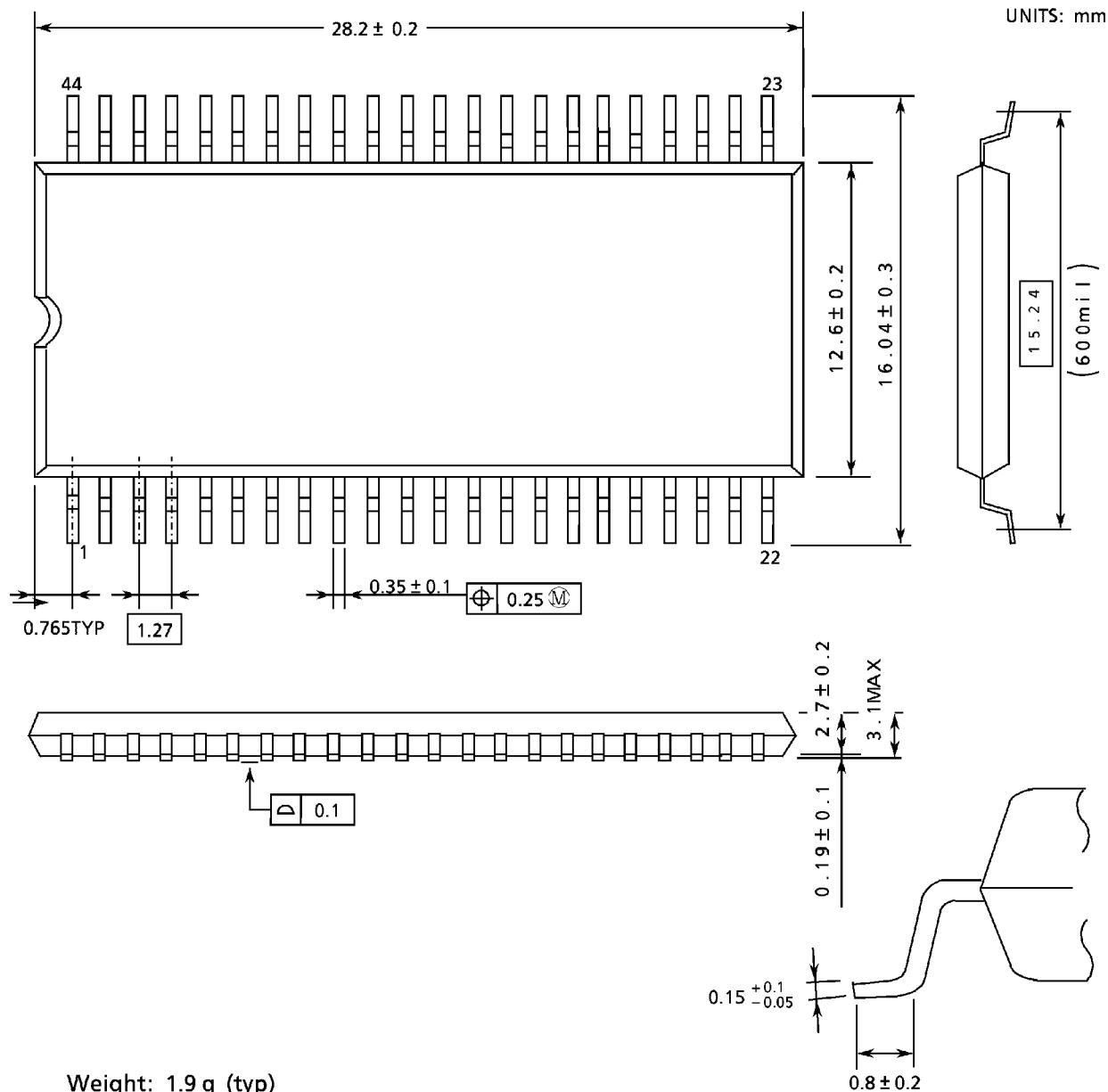
Weight: 5.7 g (typ)

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

PACKAGE DIMENSIONS

• Plastic SOP

SOP44-P-600

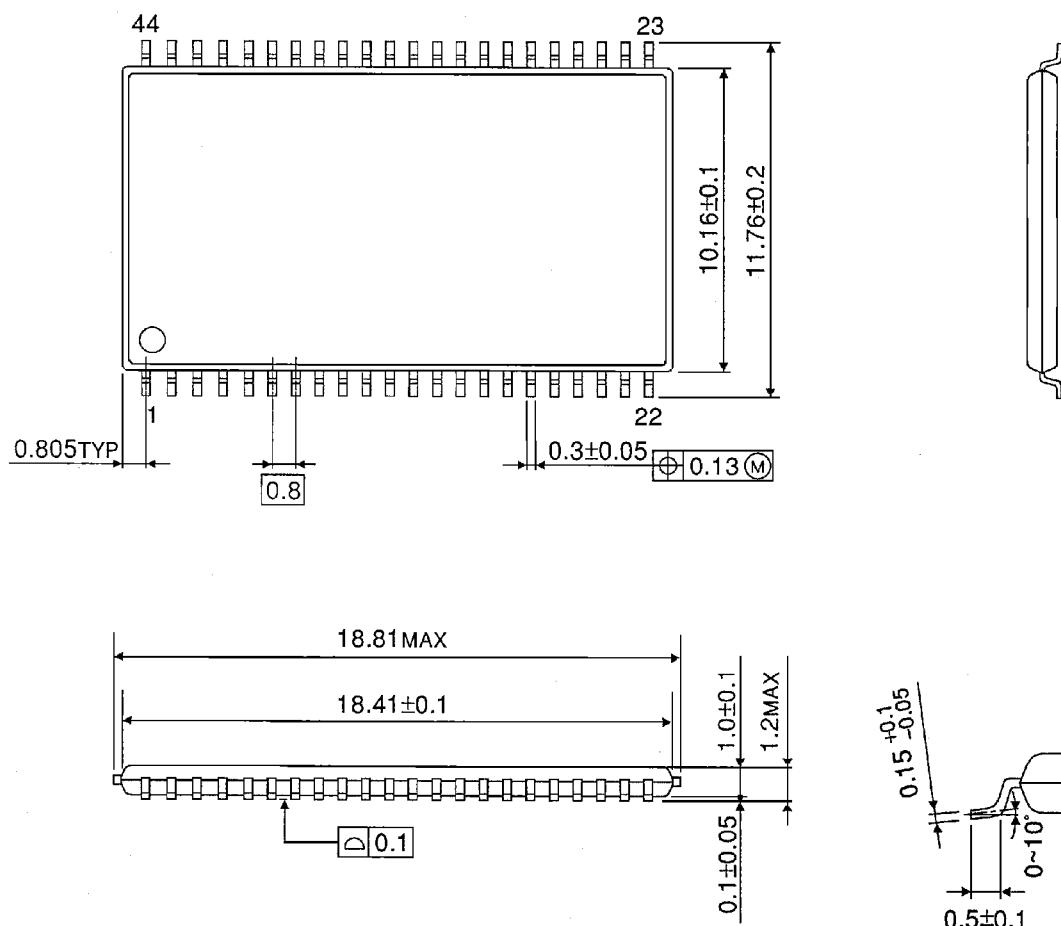


Note: Package width and length do not include mold protrusion. The permissible mold protrusion is 0.15 mm.

PACKAGE DIMENSIONS

- TC5316200CFT

TSOP44-P-400



Weight: 0.5 g (typ)