

32 MBIT (2,097,152 WORD BY 16 BITS/4,194,304 WORD BY 8 BITS) CMOS MASK ROM

DESCRIPTION

The TC5332200AF/AFT is a 33,554,432-bit Read Only Memory organized as 2,097,152 words by 16 bits when $\overline{\text{BYTE}}$ is logical high, and as 4,194,304 words by 8 bits when $\overline{\text{BYTE}}$ is logical low.

The TC5332200AF/AFT is most suitable for application such as program memory, data memory, and character generators.

The TC5332200AF/AFT is packaged in a standard 600 mil 44-pin SOP or 400 mil 44-pin Type II TSOP.

FEATURES

- Single 5 V Power Supply
- Access Time: 120 ns (max)
- Power Dissipation
 - Operating Current: 45 mA (max)
 - Standby Current : 100 μA (max)
- Fully Static Operation
- All Inputs and Outputs: TTL Compatible
- Three State Outputs
- TC5332200AF : SOP44 – P – 600
TC5332200AFT: TSOP44 – P – 400

PIN ASSIGNMENT (TOP VIEW)

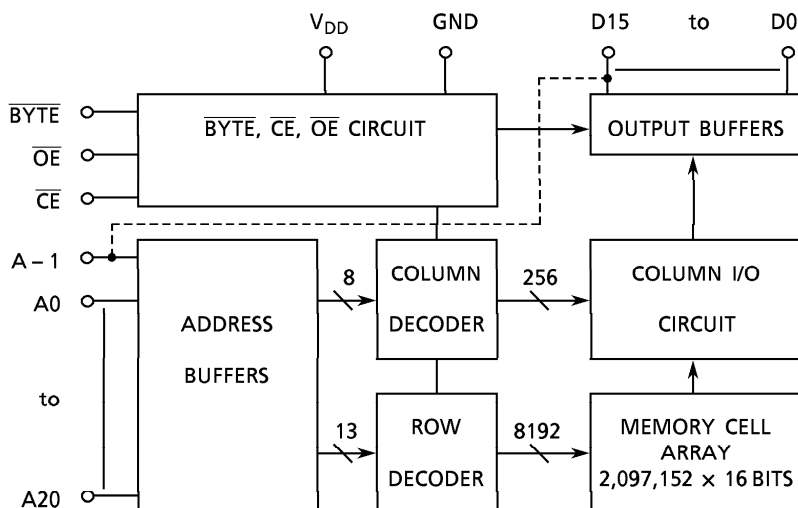
NC	1	44	A20
A18	2	43	A19
A17	3	42	A8
A7	4	41	A9
A6	5	40	A10
A5	6	39	A11
A4	7	38	A12
A3	8	37	A13
A2	9	36	A14
A1	10	35	A15
A0	11	34	A16
$\overline{\text{CE}}$	12	33	BYTE
GND	13	32	GND
$\overline{\text{OE}}$	14	31	D15/A – 1
D0	15	30	D7
D8	16	29	D14
D1	17	28	D6
D9	18	27	D13
D2	19	26	D5
D10	20	25	D12
D3	21	24	D4
D11	22	23	V _{DD}

TC5332200AF/AFT

PIN NAMES

A0 to A20	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 _{DD}	Power Supply
GND	Ground
NC	No Connection

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 7.0	V
V_{OUT}	Output Voltage	0 to $V_{DD} + 0.5$	V
P_D	Power Dissipation	0.6	W
T_{STG}	Storage Temperature	- 55 to 150	°C
T_{OPR}	Operating Temperature	- 10 to 70	°C
T_{SOLDER}	Soldering Temperature (10 s)	260	°C

DC RECOMMENDED OPERATING CONDITIONS ($T_a = -10^\circ$ 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	–	$V_{DD} + 0.5$	V
V_{IL}	Input Low Voltage	– 0.3	–	0.8	V

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

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	$V_{OH} = 2.4\text{ V}$	– 1.0	–	mA
I_{OL}	Output Low Current	$V_{OL} = 0.4\text{ V}$	2.0	–	mA
I_{DDS1}	Standby Current	$\overline{CE} = V_{IH}$	–	2	mA
I_{DDS2}		$\overline{CE} = V_{DD} - 0.2\text{ V}$	–	100	μA
I_{DDO1}	Operating Current	$V_{IN} = V_{IH}/V_{IL}$, $t_{\text{cycle}} = 120\text{ ns}$ $I_{OUT} = 0\text{ mA}$	–	50	mA
I_{DDO2}		$V_{IN} = V_{DD} - 0.2\text{ V}/0.2\text{ V}$ $t_{\text{cycle}} = 120\text{ ns}$, $I_{OUT} = 0\text{ mA}$	–	45	mA

CAPACITANCE ($f = 1\text{ MHz}$, $T_a = 25^\circ\text{C}$, $V_{DD} = 5.0\text{ V}$)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
C_{IN}	Input Capacitance	$V_{IN} = 0\text{ V}$	–	15	pF
C_{OUT}	Output Capacitance	$V_{OUT} = 0\text{ V}$	–	15	pF

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

AC CHARACTERISTICS AND OPERATING CONDITIONS

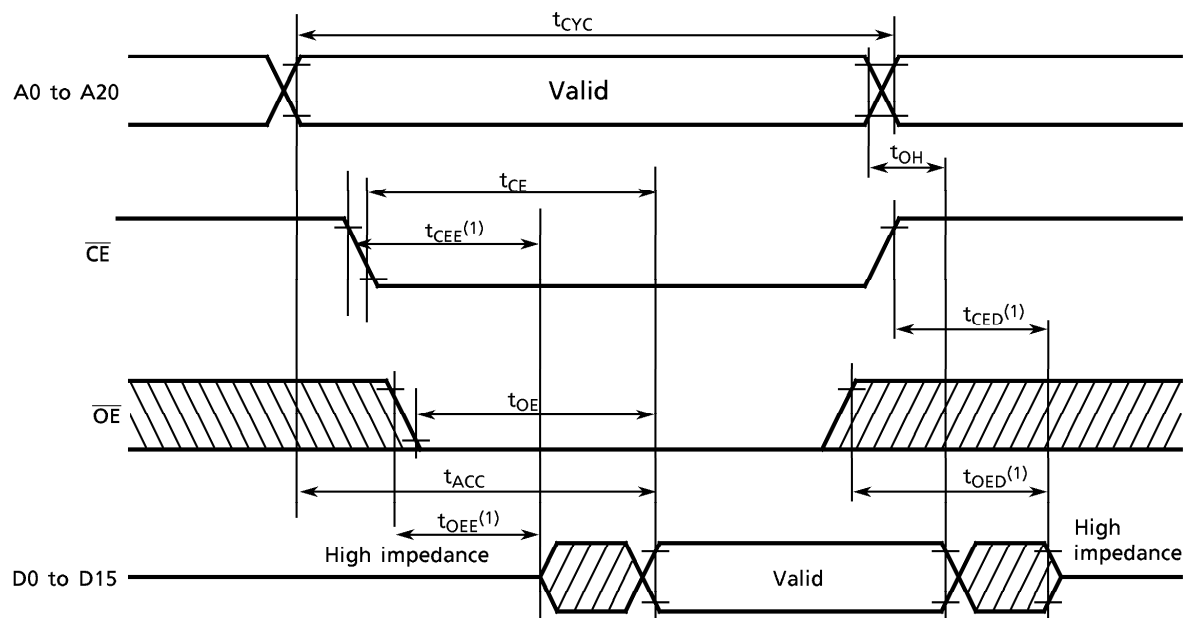
($T_a = -10^\circ$ to 70°C , $V_{DD} = 5\text{ V} \pm 10\%$)

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_{CEE}	Output Enable Time from \overline{CE}	0	–	ns
t_{OEE}	Output Enable Time from \overline{OE}	0	–	ns
t_{BTE}	Output Enable Time from \overline{BYTE}	0	–	ns
t_{CED}	Output Disable Time from \overline{CE}	–	45	ns
t_{OED}	Output Disable Time from \overline{OE}	–	35	ns
t_{RTD}	Output Disable Time from \overline{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/2.2 V
 Input Rise and Fall Time : 5 ns

16-BIT READ MODE



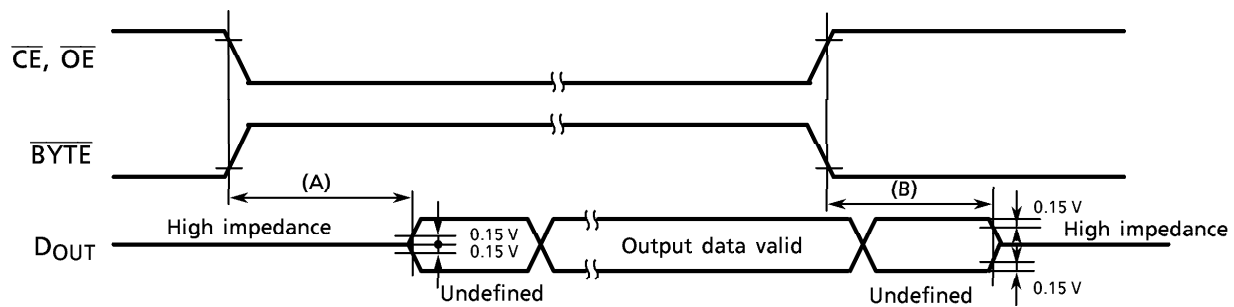
Note: $\overline{BYTE} = V_{IH}$

Note 1

The following parameters are specified:

(A) t_{CEE} , t_{OEE} , t_{BTE} Output Enable Time

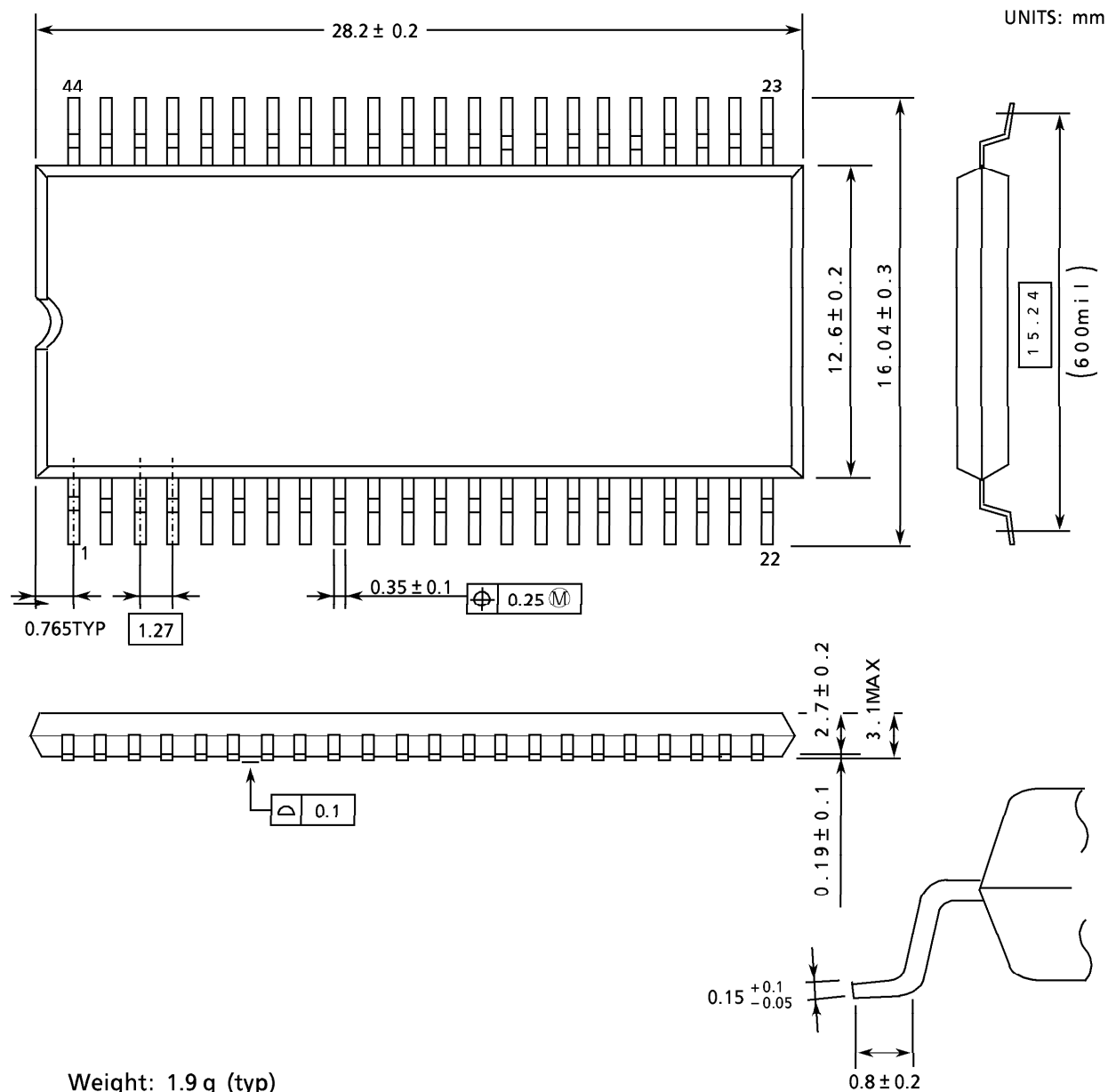
(B) t_{CED} , t_{OED} , t_{BTD} Output Disable Time



PACKAGE DIMENSIONS

● Plastic SOP

SOP44-P-600



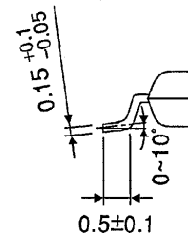
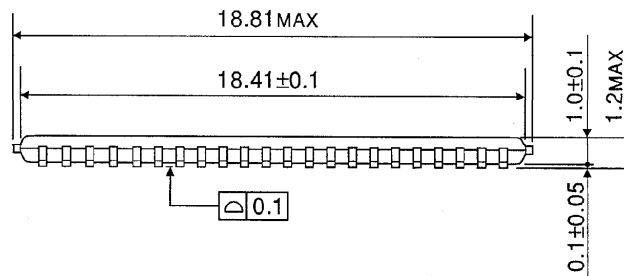
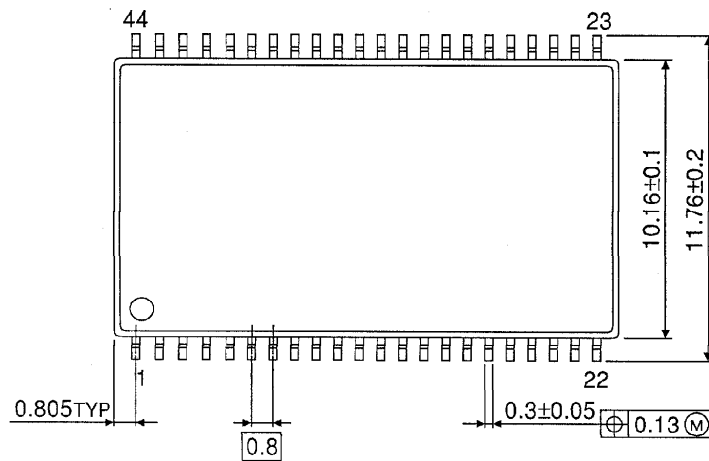
Weight: 1.9 g (typ)

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

PACKAGE DIMENSIONS

- Plastic TSOP
TSOP44-P-400

UNITS: mm



Weight: 0.5 g (typ)