

TOSHIBA MOS MEMORY PRODUCTS

65,536 WORD \times 1 BIT CMOS STATIC RAM
SILICON GATE CMOS

TC5562P/J-35, TC5562P/J-45
TC5562P/J-55

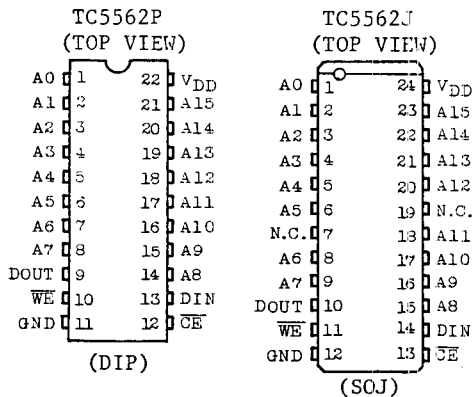
DESCRIPTION

The TC5562P/J is a 65,536 bit high speed static random access memory organized as 65,536 words by 1 bit using CMOS technology, and operated from a single 5-volt supply. Toshiba's high performance device technology provides both high speed and low power features with a maximum access time of 35ns/45ns/55ns and maximum operating current of 100mA at minimum cycle time. The TC5562P/J also features and automatic standby mode. When deselected by chip Enable (CE), the operating current is reduced from 100mA to 20mA. The TC5562P/J is suitable for use in main memory of high speed computer and pattern memory, where high speed/high density are required. The TC5562P is moulded in a 22 pin plastic DIP with 300 mil width for high density surface assembly and the TC5562J is moulded in a 24 pin plastic SOJ with 300 mil width for high density surface assembly. The TC5562P/J is fabricated with ion implanted CMOS silicon gate MOS technology for high performance and high reliability.

FEATURES

- Fast access time: TC5562P/J-35 35ns(MAX.)
TC5562P/J-45 45ns(MAX.)
TC5562P/J-55 55ns(MAX.)
- Low power dissipation:
Operation 100mA (MAX.)
Standby 20mA (MAX.)
- 5V single power supply
- Fully static operation
- Directly TTL compatible: All Input and Output
- I/O separate
- Package: 22 Pin Plastic 300 mil DIP : TC5562P
24 Pin Plastic 300 mil SOJ : TC5562J

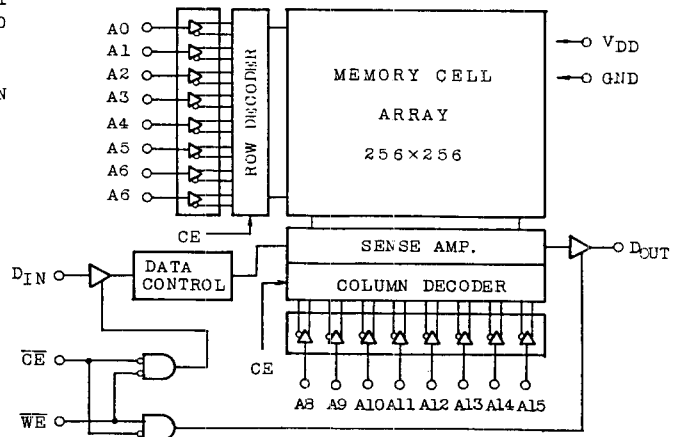
PIN CONNECTION



PIN NAMES

A0 ~ A15	Address Inputs
DIN	Data Input
DOUT	Data Output
\overline{CE}	Chip Enable Input
\overline{WE}	Write Enable Input
V _{DD}	Power (+5V)
GND	Ground
N.C.	No Connection

BLOCK DIAGRAM



MAXIMUM RATINGS

SYMBOL	ITEM	RATING	UNIT
V _{DD}	Power Supply Voltage	-0.3~7.0	V
V _{IN}	Input Voltage	-2.0~7.0	V
V _{OUT}	Output Voltage	-0.5~V _{DD} +0.5	V
P _D	Power Dissipator	650	mW
T _{SOLDER}	Soldering Temperature	260 · 10	°C·sec
T _{STG}	Storage Temperature	-65~150	°C
T _{OPR}	Operating Temperature	0~70	°C

D. C. RECOMMENDED OPERATING CONDITIONS

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	-3.0	—	0.8	V

D. C and OPERATING CHARACTERISTICS (T_a=0~70°C, V_{DD}=5V±10%)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
I _{IL}	Input Leakage Current	V _{IN} =0~V _{DD}	—	—	±1.0	μA
I _{OH}	Output High Current	V _{OH} =2.4V	-8	—	—	mA
I _{OL}	Output Low Current	V _{OL} =0.4V	8	—	—	mA
I _{LO}	Output Leakage Current	CE=V _{IH} or WE=V _{IL} V _{OUT} =0~V _{DD}	—	—	±1.0	μA
I _{DDO}	Operating Current	V _{DD} =5.5V, t _{cycle} =Min cycle, CE=V _{IL} Other Input=V _{IH} /V _{IL}	—	—	100	mA
I _{DDs1}	Standby Current	CE=V _{IH}	—	—	20	mA
I _{DDs2}		CE=V _{DD} -0.2V Other Input=V _{DD} -0.2V or 0.2V	—	—	2	

CAPACITANCE (T_a=25°C)

SYMBOL	PARAMETER	TEST CONDITION	MAX.	UNIT
C _{IN}	Input Capacitance	V _{IN} =GND	10	pF
C _{OUT}	Output Capacitance	V _{OUT} =GND	10	pF

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

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A. C. CHARACTERISTICS (Ta=0~70°C, VDD=5V±10%)

Read Cycle

SYMBOL	PARAMETER	TC5562P/J-35		TC5562P/J-45		TC5562P/J-55		UNIT
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
t _{RC}	Read Cycle Time	35	—	45	—	55	—	ns
t _{ACC}	Address Access Time	—	35	—	45	—	55	
t _{CO}	Chip Enable Access Time	—	35	—	45	—	55	
t _{COE}	Chip Enable to Output in Low-Z	5	—	5	—	5	—	
t _{COD}	Chip Disable to Output in High-Z	—	15	—	15	—	15	
t _{OH}	Output Data Hold Time	5	—	5	—	5	—	

Write Cycle

SYMBOL	PARAMETER	TC5562P/J-35		TC5562P/J-45		TC5562P/J-55		UNIT
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	
t _{WC}	Write Cycle Time	35	—	45	—	55	—	ns
t _{WP}	Write Pulse Width	25	—	30	—	35	—	
t _{CW}	Chip Enable to End of Write	25	—	30	—	35	—	
t _{AS}	Address Set up Time	0	—	0	—	0	—	
t _{WR}	Write Recovery Time	0	—	0	—	0	—	
t _{OE_W}	WE to Output Low-Z	0	—	0	—	0	—	
t _{OD_W}	WE to Output High-Z	—	15	—	15	—	15	
t _{DS}	Data Set up Time	20	—	25	—	25	—	
t _{DH}	Data Hold Time	0	—	0	—	0	—	

A. C. TEST CONDITIONS

Input Pulse Levels	2.4V/0.6V
Input Rise and Fall Times	5ns
Input and Output Timing Reference Levels	1.5V
Output Load	See Fig. 1

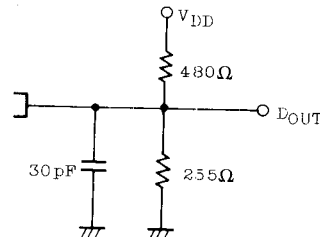
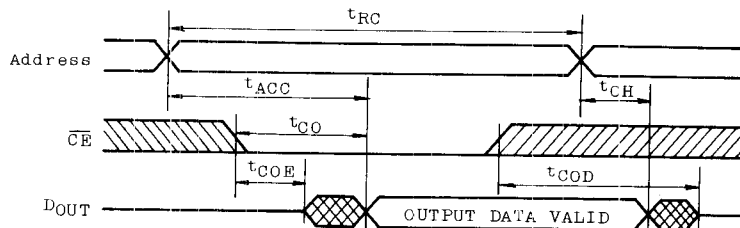


Fig.1 Output Load

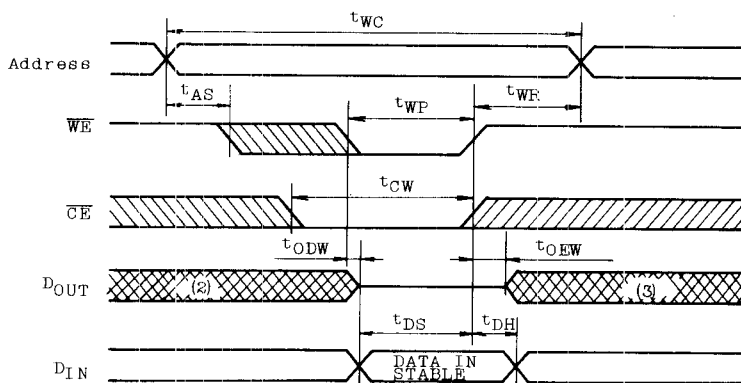
TC5562P/J-35, TC5562P/J-45 TC5562P/J-55

TIMING WAVEFORMS

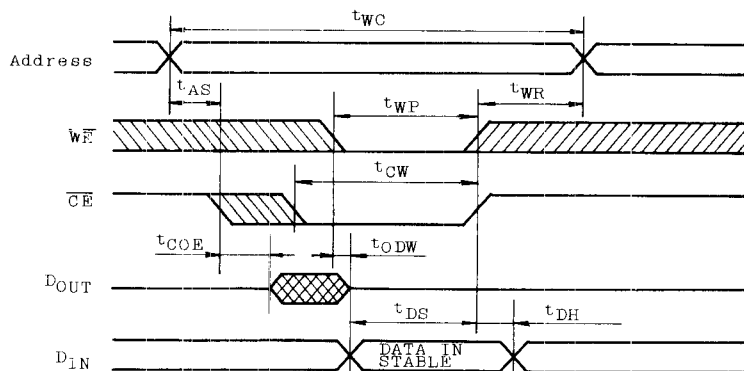
● READ CYCLE (1)



● WRITE CYCLE 1 (\overline{WE} Controlled Write)



● WRITE CYCLE 2 (\overline{CE} Controlled Write)

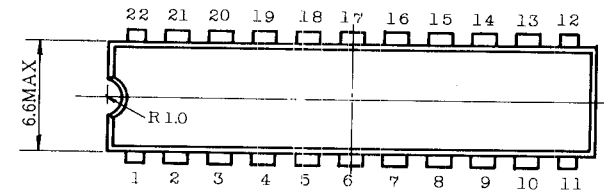


Note :

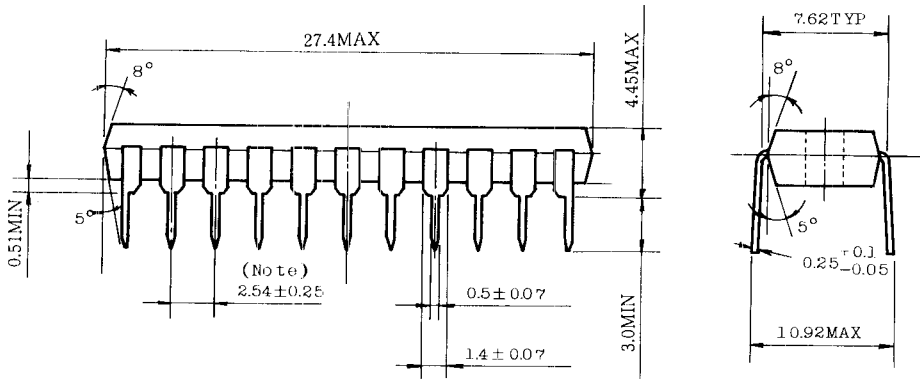
1. \overline{WE} is High for Read Cycle.
2. Assuming that \overline{CE} Low transition occurs coincident with or after \overline{WE} Low transition, Outputs remain in a high impedance state.
3. Assuming that \overline{CE} High transition occurs coincident with or prior \overline{WE} High transition, Outputs remain in a high impedance state.
4. The operating temperature (T_a) is guaranteed with transverse air flow exceeding 400 linear feet per minute.

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OUTLINE DRAWINGS



Unit in mm



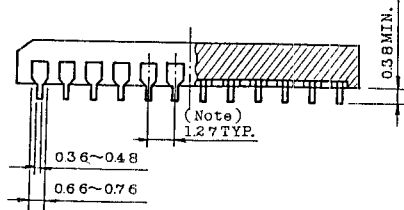
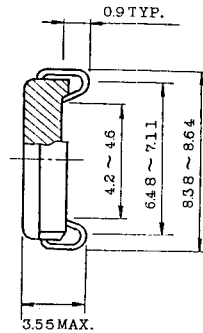
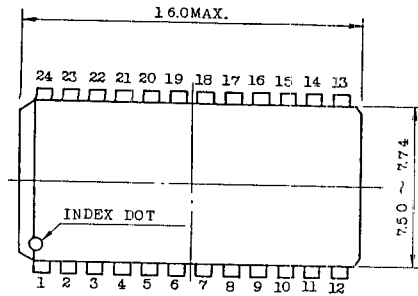
Note : Each lead pitch is 2.54mm.

All leads are located within 0.25mm of the true longitudinal position with respect to No.1 and No.22 leads.

TC5562P/J-35, TC5562P/J-45 TC5562P/J-55

• Plastic SOJ

Unit in mm



Note: Each lead pitch is 1.27mm.

All leads are located within 0.12mm of the true longitudinal position with respect to No. 1 and No. 24 leads.

Note: Toshiba does not assume any responsibility for use of any circuitry described; no circuit patent licenses are implied, and Toshiba reserves the right, at any time without notice, to change said circuitry.
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