

OKI semiconductor

MSM53256

32,768 WORD x 8 BIT MASK ROM

GENERAL DESCRIPTION

The MSM53256RS is a silicon gate CMOS device ROM with 32,768 words x 8 bit capacity. It operates on a 5V single power supply and all inputs and outputs are TTL compatible. The adoption of an asynchronous system in the circuit requires no external clock assuring extremely easy operation. The availability of power down mode contributes to the low power dissipation when the chip is not selected. The application of a byte system is most suitable for use as a large capacity fixed memory for microcomputers and data terminals.

Since it provides signals, the connection of output terminals of other chips with the wired OR is possible ensuring an easy expand operation of memory and bus line control.

FEATURES

- 256k bits: 32,768 words x 8 bits
- High speed: access time 150 ns max
- Low power: active current 15 mA max
standby current 0.1 mA max
- Wide tolerance operating: $V_{CC} = 5V \pm 10\%$
- Fully static operating: using no clock
- Fully TTL compatible
- Pin compatible to 256k EPROM
- Packaged to 28 pins plastic
- Fabricated with CMOS silicon gate technology



PIN CONFIGURATION

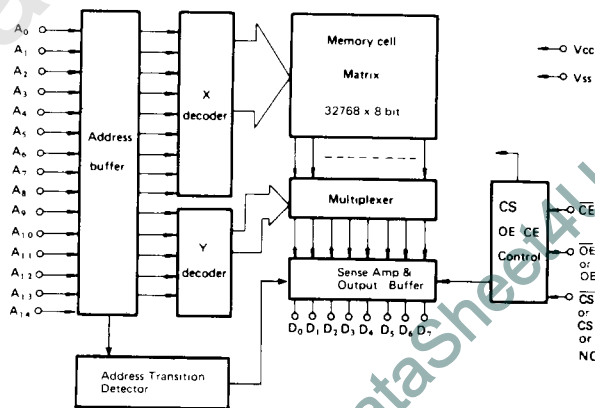
(Top View)

(INH)CS	1	28	V _{CC}
A ₁₃	2	27	A ₁₄
A ₁₂	3	26	A ₁₁
A ₁₁	4	25	A ₁₀
A ₁₀	5	24	A ₉
A ₉	6	23	A ₈
A ₈	7	22	OE
A ₇	8	21	A ₁₀
A ₁₁	9	20	CE
A ₁₀	10	19	D ₇
D ₀	11	18	D ₆
D ₁	12	17	D ₅
D ₂	13	16	D ₄
V _{SS}	14	15	D ₃

CS : Chip select
OE : Output enable
V_{CC}, V_{SS} : Power supply voltage
A₀ ~ A₁₄ : Address input
D₀ ~ D₇ : Data output
CE : CHip enable

Note: CS active level is specified by customer.

FUNCTIONAL BLOCK DIAGRAM



6

ABSOLUTE MAXIMUM RATINGS

(Ta = 25°C)

Rating	Symbol	Value	Unit	Conditions
Power Supply Voltage	V _{cc}	-0.3 to 7	V	Respect to V _{ss}
Input Voltage	V _I	-0.3 to V _{cc} + 0.3	V	Respect to V _{ss}
Output Voltage	V _O	-0.3 to V _{cc} + 0.3	V	Respect to V _{ss}
Power Dissipation	P _D	1	W	Per package
Operating Temperature	T _{opr}	0 to 70	°C	—
Storage Temperature	T _{stg}	-55 to 150	°C	—

OPERATING CONDITION AND DC CHARACTERISTICS

Parameter	Symbol	Measuring Condition	Rating			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V _{cc}	—	4.5	5	5.5	V
	V _{ss}	—	0	0	0	V
Input Signal Level	V _{IH}	—	2.2	5	V _{cc} + 0.3	V
	V _{IL}	—	-0.3	0	0.8	V
Output Signal Level	V _{OH}	I _{OH} = -400 μA	2.4	—	—	V
	V _{OL}	I _{OL} = 2.1 mA	—	—	0.4	V
Input Leakage Current	I _{LI}	V _I = 0V or V _{cc}	-10	—	10	μA
Output Leakage Current	I _{LO}	V _O = 0V or V _{cc} Chip not selected	-10	—	10	μA
Power Supply Current	I _{CCA}	V _{cc} = Max. I _O = 0 mA, t _C = 150 ns	—	—	15	mA
	I _{CCS}	V _{cc} = Max. $\overline{CE}$ = V _{cc} - 0.2V	—	—	100	μA
	I _{CCS1}	V _{cc} = Max. $\overline{CE}$ = V _{IH} min.	—	—	500	μA
Operating Temperature	T _{opr}	—	0	—	70	°C

AC CHARACTERISTICS

TIMING CONDITIONS

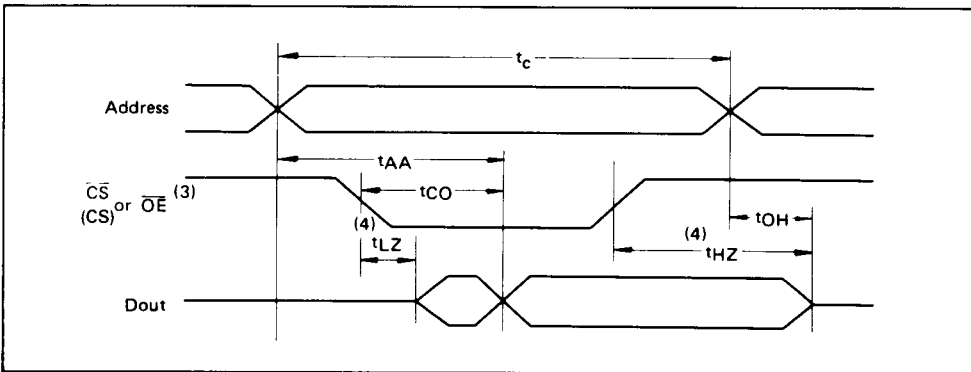
Parameter	Conditions
Input Signal Level	V _{IH} = 2.4V, V _{IL} = 0.6V
Input Rising, Falling Time	t _r =t _f = 5 ns
Timing Measuring Point Voltage	Input Voltage=1.5V
	Output Voltage=0.8V & 2.0V
Loading Condition	C _L =100 pF + 1 TTL

READ CYCLE

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

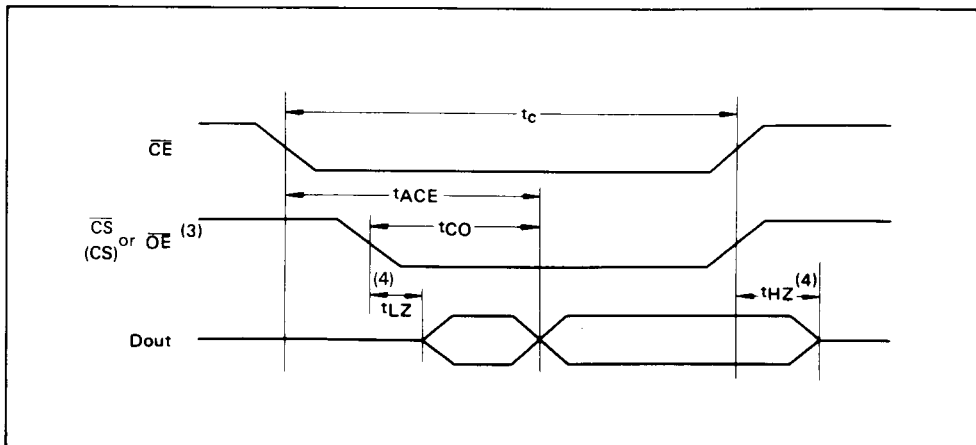
Parameter	Symbol	Specification Value			Unit	Remarks
		Min.	Typ.	Max.		
Cycle Time	t_c	150	—	—	ns	
Address Access Time	t_{AA}	—	—	150	ns	
Chip Enable Access Time	t_{ACE}	—	—	150	ns	
Output Delay Time	t_{CO}	—	—	50	ns	
Output Setting Time	t_{LZ}	10	—	—	ns	
Output Disable Time	t_{HZ}	10	—	50	ns	
Output Retaining Time	t_{OH}	10	—	—	ns	

1) READ CYCLE-1⁽¹⁾



6

2) READ CYCLE-2⁽²⁾



- Notes: (1) $\overline{CE}$ is "L" level.
 (2) The address is decided at the same time as or ahead of $\overline{CE}$ "L" level.
 (3) $\overline{CS}$ is shown in the negative logic here, however the active level is freely selected.
 (4) t_{LZ} is determined by the later $\overline{CE}$ "L", $\overline{OE}$ "L" or $\overline{CS}$ "L".
 t_{HZ} is determined by the earlier $\overline{CE}$ "H", $\overline{OE}$ "H" or $\overline{CS}$ "H".
 t_{HZ} shows time until floating therefore it is not determined by the output level.

INPUT/OUTPUT CAPACITANCE

($T_a = 25^\circ\text{C}$, $f = 1\text{ MHz}$)

Parameter	Symbol	Specification Value		Unit	Remarks
		Min.	Max.		
Input Capacitance	C_I	—	8	pF	$V_I=0\text{V}$
Output Capacitance	C_O	—	6	pF	$V_O=0\text{V}$