OKI semiconductor

MSM38256ARS

32768 WORD x 8 BIT MASK ROM (E3-S-030-32)

GENERAL DESCRIPTION

The MSM38256ARS is an N-channel silicon gate E/DMOS device ROM with a 32,768 word x 8 bit capacity. It operates on a 5V single power supply and the 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 which is as low as 6mA (max) when the chip is not selected. The application of a byte system and the pin compatibility with standard UV EPROMs make the device most suitable for use as a large-capacity fixed memory for microcomputers and data terminals.

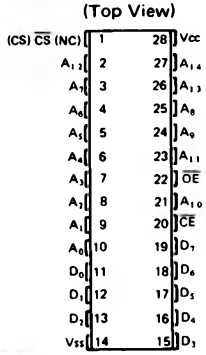
Since it provides CE, OE, CS signals, the connection of output terminals of other chips with the wired OR is possible ensuring an easy expand operation of memory and bus line control.

FEATURES

- 32768 words x 8 bits
- 5V single power supply
- Access time: 150 ns MAX
- Input/output TTL compatible
- 3-state output
- Power down mode
- 28-pin DIP

PIN CONFIGURATION

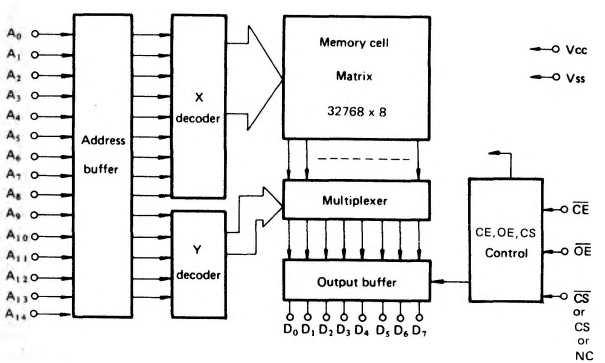
(Top View)



$\overline{CE}$	:	Chip enable
$\overline{OE}$	:	Output enable
(CS) $\overline{CS}$	:	Chip select
Vcc, Vss	:	Power supply voltage
$A_0 \sim A_{13}$	:	Address input
$D_0 \sim D_7$	:	Data output
(NC)	:	No Connection

Note: $\overline{CS}$ active level is specified by customers.

FUNCTIONAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

(Ta = 25°C)

Rating	Symbol	Value	Unit	Conditions
Power Supply Voltage	V_{CC}	−0.5 to 7	V	Respect to V_{SS}
Input Voltage	V_I	−0.5 to 7	V	
Output Voltage	V_O	−0.5 to 7	V	
Operating Temperature	T_{opr}	0 to 70	°C	
Storage Temperature	T_{stg}	−55 to 150	°C	
Power Dissipation	PD	1.0	W	Per package

OPERATING CONDITION AND DC CHARACTERISTICS

Parameter	Symbol	Measuring Conditions	Rating			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V_{CC}		4.5	5	5.5	V
	V_{SS}		0	0	0	V
"H" Input Signal Level	V_{IH}		2.2	5	6	V
"L" Input Signal Level	V_{IL}		−0.5	0	0.8	V
"H" Output Signal Level	V_{OH}	I_{OH} = −400 μA	2.4		V_{CC}	V
"L" Output Signal Level	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_{CC}	V_{CC} = Max. I_O = 0 mA			60	mA
	I_{CCS}	V_{CC} = Max.			6	mA
Peak Power On Current	I_{PO}	V_{CC} = GND ~ V_{CC} Min. CE = V_{CC} or V_{IH}			60	mA
Operating Temperature	Topr		0		70	°C
Load Capacitance	C_L				100	pF
Fan Out	N	TTL Load			1	Piece

AC CHARACTERISTICS

TIMING CONDITIONS

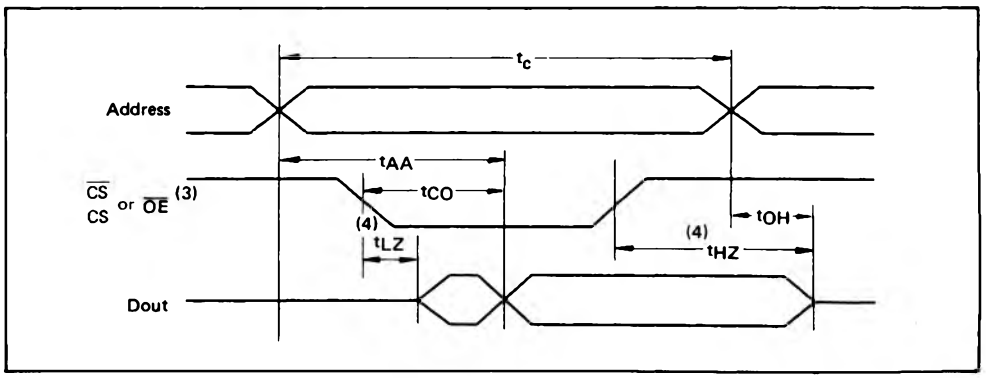
Parameter	Conditions
Input Signal Level	V_{IH}=2.4V V_{IL}=0.6V
Input Rising, Falling Time	tr=tf=15 ns
Timing Measuring Point Voltage	Input Voltage=1.5V
	Output Voltage=0.8 & 2.0V
Loading Condition	C_L=100 pF + 1 TTL

READ CYCLE

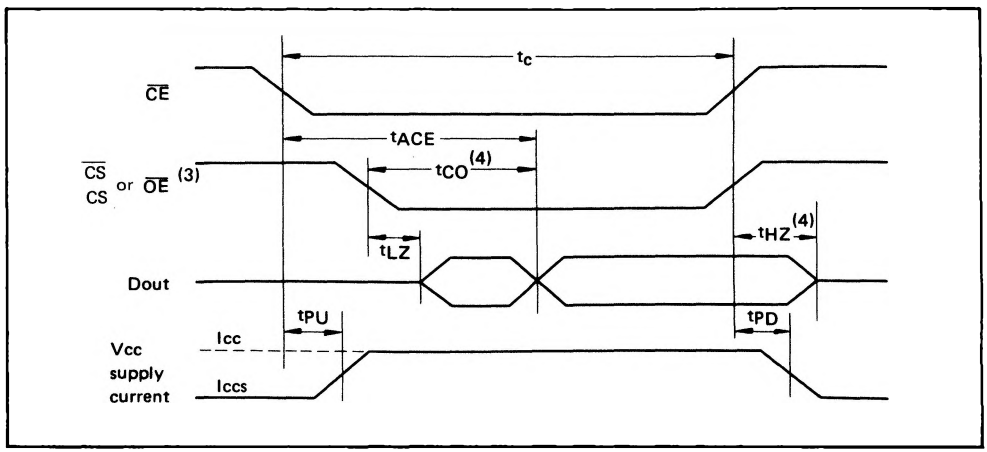
(V_{CC} = 5V ±10%, V_{SS} = 0V, Ta = 0°C to +70°C)

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	
Power Up Time	t_{PU}	0			ns	
Power Down Time	t_{PD}			100	ns	

1) READ CYCLE-1 (1)



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) $\overline{CS}$ are shown in the negative logic here, however the active level is freely selected.
(4) t_{CO} and t_{LZ} are 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

(Ta = 25°C, f = 1 MHz)

Parameter	Symbol	Specification Value		Unit	Remarks
		Min.	Max.		
Input Capacitance	C_I		8	pF	V_I=0V
Output Capacitance	C_O		6	pF	V_O=0V