

ELMO**EMC01MS08**

CMOS STATIC RAM MODULE: 128K x 8

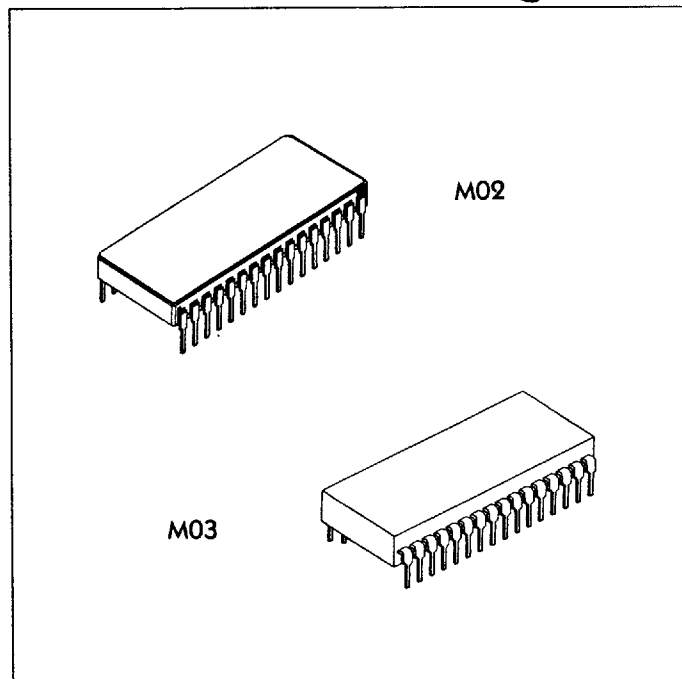
T-46-23-14

DESCRIPTION

The ELMO EMC01MS08 is a 131,072-word x 8-bit high speed CMOS static RAM module suitable for use in low power and high speed applications. It comes in several package and speed options, and operates from a single +5V supply.

FEATURES

- ❖ 131,072-word x 8-bit Organization
- ❖ Access Times of 55, 70 or 100ns
- ❖ Low Power Operation:
 - Standby: 15mW (Typ.)
 - Operating: 325mW (Typ.)
- ❖ Single +5V ($\pm 10\%$) Power Supply
- ❖ TTL Compatible Inputs and Outputs
- ❖ Fully Static Operation
- ❖ Available in MIL (-55 to +125°C) or Commercial (0 to +70°C) Temp. Range
- ❖ Package Styles:
 - 32 Pin 600-mil Sidebrazed DIP (JEDEC)
 - 32 Pin 600-mil Plastic DIP (JEDEC)

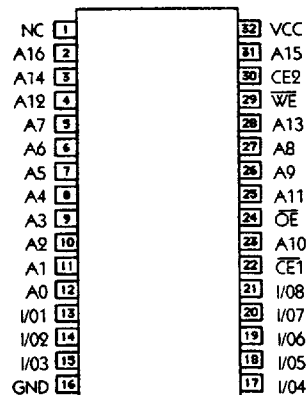
**PACKAGE/SPEED OPTIONS**

Package: 32 pin 600-mil Sidebrazed DIP Module

Part Number	Speed
EMC01MS08M02 -055D	55ns
-070D	70ns
-100D	100ns

Package: 32 Pin 600-mil Plastic DIP Module

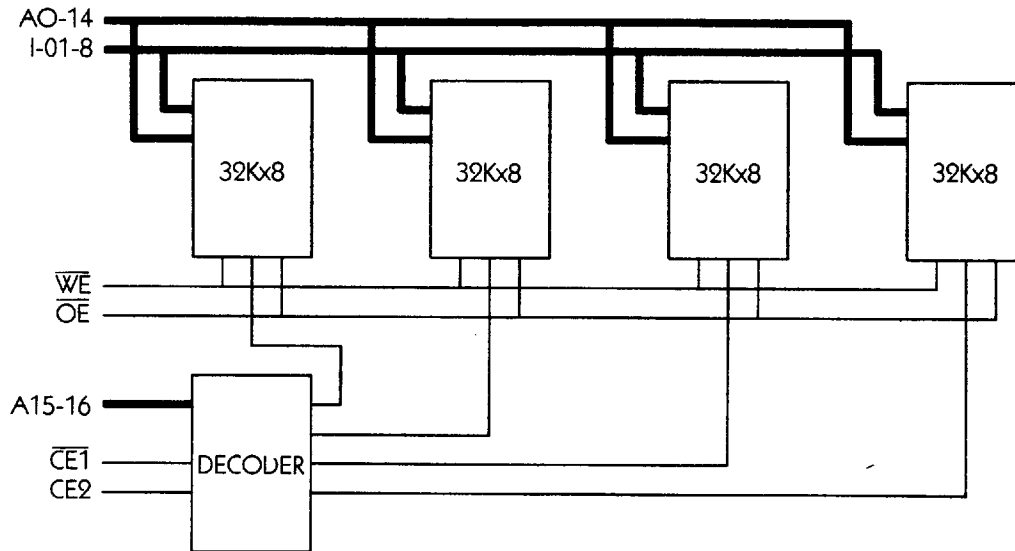
Part Number	Speed
EMC01MS08M03 -055C	55ns
-070C	70ns
-100C	100ns

PIN CONFIGURATION**PIN NAMES**

A0 to A16	Address Input
I/O1 to I/O8	Data Input/Output
$\overline{CE}1, CE2$	Chip Enable
\overline{WE}	Write Enable
\overline{OE}	Output Enable
VCC	+5V Power Supply
GND	Ground
NC	No Connect

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BLOCK DIAGRAM**ABSOLUTE MAXIMUM RATINGS**

Item	Symbol	Rating	Unit
Supply Voltage	Vcc	-0.5 to +7.0	V
Input Voltage	Vin	-0.5 to Vcc+0.5	V
Input and Output Voltage	Vi/o	-0.5 to Vcc+0.5	V
Allowable Power Dissipation	Pd	1.0	W
Operating Temperature: Mil	Topr	-55 to +125	°C
Comm:		0 to +70	
Storage Temperature	Tstg	-65 to +150	°C

TRUTH TABLE

CE1	CE2	OE	WE	MODE	I/01 TO I/08	Vcc Current
H	X	X	X	Not Selected	High Z	ISB1, ISB2
X	L	X	X	Not Selected	High Z	ISB1, ISB2
L	H	H	H	Output Disable	High Z	ICC
L	H	L	H	Read	Data Out	ICC
L	H	X	L	Write	Data In	ICC

DC OPERATING CONDITIONS (Ta= -55 to +125°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	Vcc	4.5	5.0	5.5	V
Input High Voltage	VIH	2.2		Vcc+0.3	V
Input Low Voltage	VIL	-0.3		0.8	V

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DC OPERATING CHARACTERISTICS (V_{CC}= 5V±10%, T_a=Topr.)

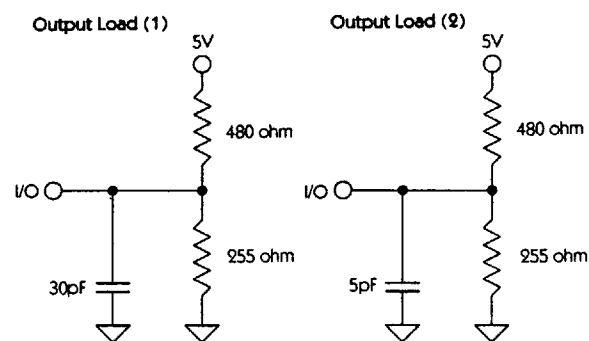
Item	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Leakage Current	IIL	V _{IN} =GND or V _{CC}	-10		10	μA
Output Leakage Current	IOL	V _{I/O} =GND or V _{CC} , $\overline{CE1}$ =V _{IH} or CE2=V _{IL} or \overline{OE} =V _{IH} or \overline{WE} =V _{IL}	-10		10	μA
Average Operating Current	ICC	Min Cycle, I _{out} =0mA		65	150	mA
Standby Current	ISB1	$\overline{CE1}$ ≥V _{CC} -0.2V, CE2≤0.2V V _{IN} ≥V _{CC} -0.2V or V _{IN} ≤0.2V		3	10	mA
	ISB2	$\overline{CE1}$ =V _{IH} , or CE2=V _{IL} or V _{IN} =V _{IL} or V _{IH}			30	mA
Output High Voltage	VOH	I _{OH} =-4.0mA	2.4			V
Output Low Voltage	VOL	I _{OL} =8.0mA			0.4	V

I/O CAPACITANCE (T_a=25°C, f=1MHz)

Item	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Capacitance	C _{IN}	V _{IN} =0V		35	50	pF
I/O Capacitance	C _{I/O}	V _{I/O} =0V		35	50	pF

AC CHARACTERISTICSAC Test Conditions (V_{CC}=5V±10%, T_a=Topr.)

Item	Condition
Input Pulse High Level	V _{IH} =3.0V
Input Pulse Low Level	V _{IL} =0V
Input Pulse Rise Time	t _r =5ns
Input Pulse Fall Time	t _f =5ns
Input and Output Timing Reference Level	1.5V
Output Load	Fig.1



Note: Load capacitance includes scope and jig capacitances.

Figure 1

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READ CYCLE

Item	Symbol	-55		-70		-100		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
Read Cycle Time	TAVAV	55		70		100		ns
Address Access Time	TAVQV		55		70		100	ns
Chip Enable Access Time (2)	TE1LQV TE2HQV		55		70		100	ns
Output Enable to Output Valid	TGLQV		30		45		50	ns
Chip Enable to Output in High Z (1X2)	TE1HQZ TE2LQZ		25		30		35	ns
Chip Enable to Output in Low Z (1X2)	TE1LQX TE2HQX	15		15		20		ns
Chip Disable to Output in High Z (1)	TGHQZ		25		30		35	ns
Output Enable to Output in Low Z (1)	TGLQX	5		5		5		ns
Output Hold from Address Change	TAVQX	5		5		15		ns

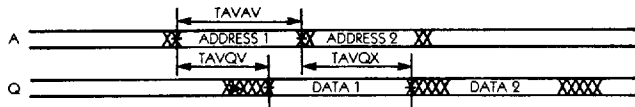
WRITE CYCLE

Item	Symbol	-55		-70		-100		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
Write Cycle Time	TAVAV	55		70		100		ns
Address Valid to End of Write	TAVWH	50		60		70		ns
Chip Enable to End of Write (2)	TE1LWH TE2HWH	50		60		70		ns
	TWLE1H TWLE2L	50		60		70		ns
Data to Write Time Overlap (2)	TDVWH	25		30		35		ns
	TDVE1H TDVE2L	25		30		35		ns
Data Hold Time From Write (2)	TWHDX	0		0		0		ns
	TE1HDX TE2LDX	0		0		0		ns
Write Pulse Width (2)	TWLWH	40		55		70		ns
	TE1LEH TE2HEL	40		55		70		ns
Address Set-Up Time (2)	TAVWL	10		10		10		ns
	TAVE1L TAVE2H	0		0		0		ns
Write Recovery Time (2)	TWHAX	5		5		5		ns
	TE1HAZ TE2LAX	5		5		5		ns
Write to Output in High Z (1)	TWLQZ		20		30		30	ns
Output Active from End of Write (1)	TWHQX	5		10		10		ns

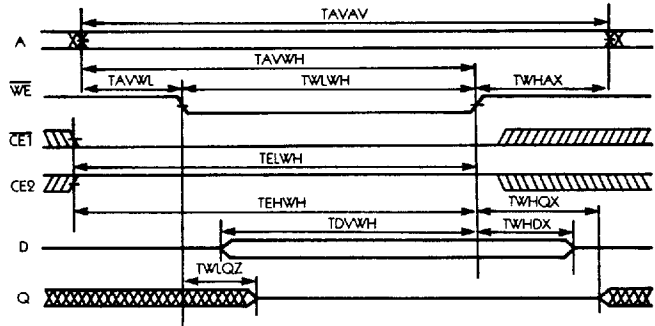
Note 1: Parameters tested on a sample basis only. Note 2: Symbols "E1" and "E2" are "CE1" and "CE2" resp.

TIMING WAVEFORM

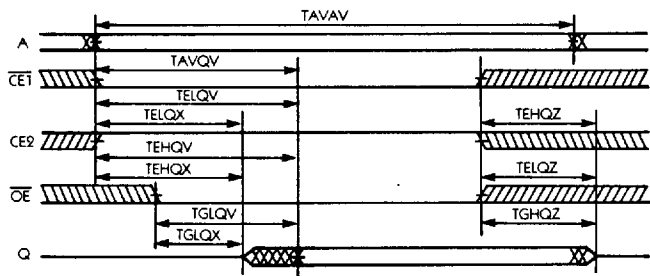
❖ Read Cycle (1): $\overline{CE1}=\overline{OE}=V_{IL}$, $\overline{CE2}=V_{IH}$, $\overline{WE}=V_{IH}$



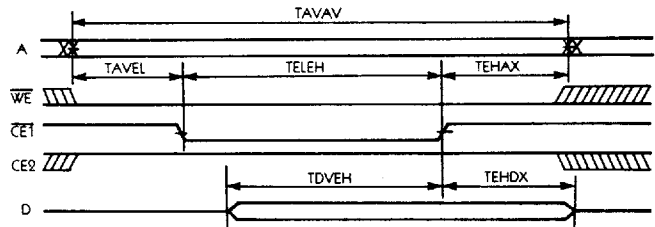
❖ Write Cycle (1): \overline{WE} control



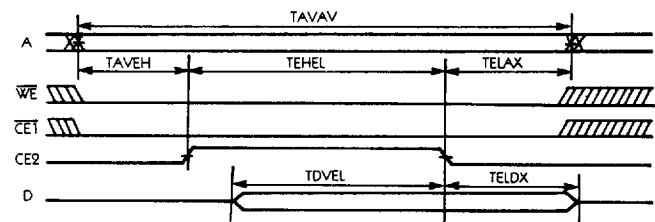
❖ Read Cycle (2): $\overline{WE}=V_{IH}$



❖ Write Cycle (2): $\overline{CE1}$ control



❖ Write Cycle (3): $\overline{CE2}$ control



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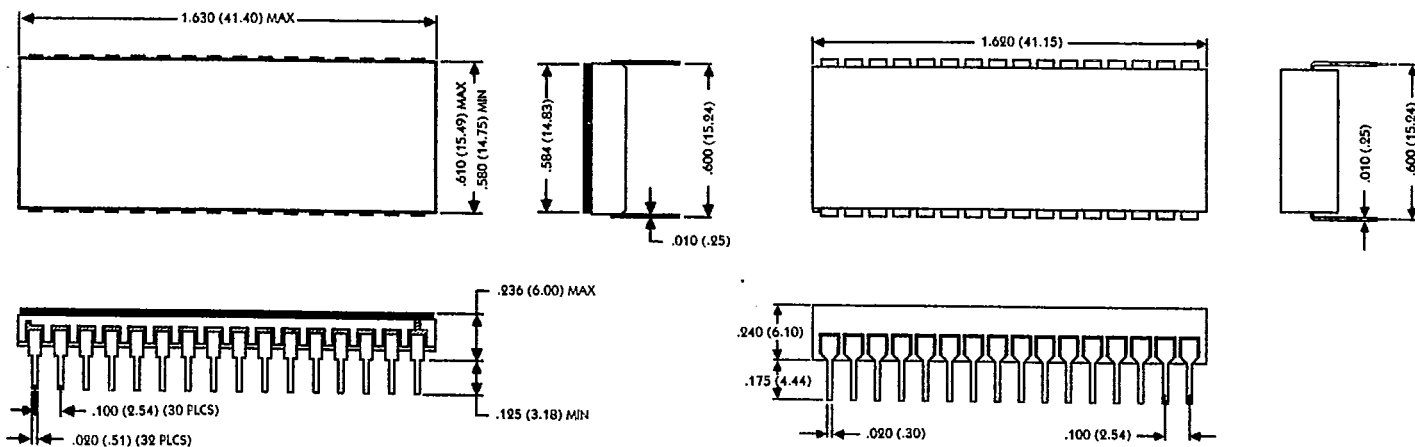
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PACKAGE OUTLINE

Dimensions in Inches (Millimeters)



Package Type M02, 32 Lead .600" Sidebrazed DIP

Package Type M03, 32 Lead .600" Plastic DIP

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