



1024K x 36 Static RAM CMOS, High Speed Module

FEATURES

- 1024K x 36 bit CMOS Static
- Random Access Memory
 - Access Times: 15, 20 and 25
 - Individual Byte Selects
 - Fully Static, No Clocks
 - TTL Compatible I/O
- High Density Package
 - 72 lead SIMM, No. 401 (Angle)
 - Common Data Inputs and Outputs
- Single +5V ($\pm 10\%$) Supply Operation

DESCRIPTION

The EDI9G361024C is a high speed 36Mb Static RAM module organized as 1024K words by 36 bits. This module is constructed from nine 1024K x 4 Static RAMs in SOJ packages on an epoxy laminate (FR4) board.

Four chip enables ($\overline{E1}$ - $\overline{E4}$) are used to independently enable the four bytes. Reading or writing can be executed on individual bytes or any combination of multiple bytes through proper use of chip enables.

The EDI9G361024C is offered in a 72 lead SIMM package, which enables 36Mb of memory to be placed in less than 1.3 square inches of board space.

All inputs and outputs are TTL compatible and operate from a single 5V supply. Fully asynchronous circuitry requires no clocks or refreshing for operation and provides equal access and cycle times for ease of use.

FIG. 1

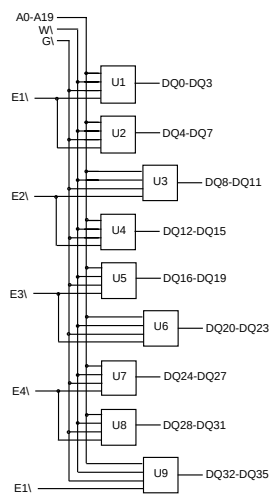
PIN CONFIGURATIONS AND BLOCK DIAGRAM

NC	1	E4\	37
NC	2	E3\	38
DQ34	3	A17\	39
DQ35	4	A16\	40
VSS	5	G\	41
DQ32	6	VSS	42
DQ33	7	DQ24	43
DQ0	8	DQ16	44
DQ8	9	DQ25	45
DQ1	10	DQ17	46
DQ9	11	DQ26	47
DQ2	12	DQ18	48
DQ10	13	DQ27	49
DQ3	14	DQ19	50
DQ11	15	A3	51
VCC	16	A10	52
A0	17	A4	53
A7	18	A11	54
A1	19	A5	55
A8	20	A12	56
A2	21	VCC	57
A9	22	A13	58
DQ12	23	A6	59
DQ4	24	DQ20	60
DQ13	25	DQ28	61
DQ5	26	DQ21	62
DQ14	27	DQ29	63
DQ6	28	DQ22	64
DQ15	29	DQ30	65
DQ7	30	DQ23	66
VSS	31	DQ31	67
W\	32	VSS	68
A15	33	A18	69
A14	34	A19	70
E2\	35	NC	71
E1\	36	NC	72

9G361024C Pin Config

PIN NAMES

A0-A19	Address Inputs
$\overline{E1}$ - $\overline{E4}$	Chip Enables
$\overline{W}$	Write Enable
$\overline{G}$	Output Enable
DQ0-DQ35	Common Data Input/Output
VCC	Power (+5V $\pm 10\%$)
VSS	Ground
NC	No Connection



9G361024C Bk Dia



ABSOLUTE MAXIMUM RATINGS*

Voltage on any pin relative to VSS	-0.5V to 7.0V
Operating Temperature TA (Ambient)	
Commercial	0°C to +70°C
Industrial	-40°C to +85°C
Storage Temperature, Plastic	-55°C to +125°C
Power Dissipation	11.6 Watts
Output Current	20 mA

*Stress greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions greater than those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

RECOMMENDED DC OPERATING CONDITIONS

Parameter	Sym	Min	Typ	Max	Units
Supply Voltage	VCC	4.5	5.0	5.5	V
Supply Voltage	VSS	0	0	0	V
Input High Voltage	VIH	2.2	--	6.0	V
Input Low Voltage	VIL	-0.3	--	0.8	V

AC TEST CONDITIONS

Input Pulse Levels	VSS to 3.0V
Input Rise and Fall Times	5ns
Input and Output Timing Levels	1.5V
Output Load	1TTL, CL = 30pF

(note: For TEHQZ, TGHQZ and TWLQZ, CL = 5pF)

DC ELECTRICAL CHARACTERISTICS

Parameter	Sym	Conditions	Min	Typ	Max	Units
Operating Power Supply Current	ICC1	$\bar{W}, \bar{E} = \text{VIL}, \text{I/O} = 0\text{mA}$, Min Cycle			1440	mA
Standby (TTL) Power Supply Current	ICC2	$\bar{E} \geq \text{VIH}, \text{VIN} \leq \text{VIL}$ or $\text{VIN} \geq \text{VIH}$			540	mA
Full Standby Power Supply Current CMOS	ICC3	$\bar{E} \geq \text{VCC}-0.2\text{V}$ $\text{VIN} \geq \text{VCC}-0.2\text{V}$ or $\text{VIN} \leq 0.2\text{V}$			90	mA
Input Leakage Current	ILI	$\text{VIN} = 0\text{V}$ to VCC	--	--	± 80	μA
Output Leakage Current	ILO	$\text{V I/O} = 0\text{V}$ to VCC	--	--	± 20	μA
Output High Voltage	VOH	$\text{IOH} = -4.0\text{mA}$	2.4	--	--	V
Output Low Voltage	VOL	$\text{IOL} = 8.0\text{mA}$	--	--	0.4	V

*Typical: TA = 25°C, VCC = 5.0V

TRUTH TABLE

$\bar{E}$	$\bar{W}$	$\bar{G}$	Mode	Output	Power
H	X	X	Standby	HIGH Z	ICC2/ICC3
L	H	L	Read	DOUT	ICC1
L	L	X	Write	DIN	ICC1
L	H	H	Output Deselect	HIGH Z	ICC1

CAPACITANCE

(f=1.0MHz, VIN=VCC or VSS)

Parameter	Sym	Max	Unit
Address Lines	CI	60	pF
Data Lines	CD/Q	20	pF
Chip Enable Line	CC	20	pF
Write Line	CN	60	pF

These parameters are sampled, not 100% tested.



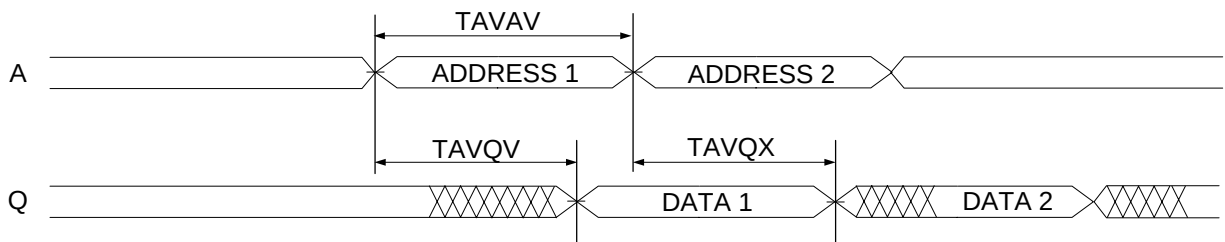
AC CHARACTERISTICS READ CYCLE

Parameter	Symbol		15ns		20ns		25ns		Units
	JEDEC	Alt	Min	Max	Min	Max	Min	Max	
Read Cycle Time	TAVAV	TRC	15		20		25		ns
Address Access Time	TAVQV	TAA		15		20		25	ns
Chip Enable Access	TELQV	TACS		15		20		25	ns
Chip Enable to Output in Low Z (1)	TELQX	TCLZ	3		3		3		ns
Chip Disable to Output in High Z (1)	TEHQZ	TCHZ		7		10		12	ns
Output Hold from Address Change	TAVQX	TOH	3		3		3		ns
Output Enable to Output Valid	TGLQV	TOE		8		8		10	ns
Output Enable to Output in Low Z (1)	TGLQX	TOLZ	0		0		0		ns
Output Disable to Output in High Z(1)	TGHQZ	TOHZ		7		8		10	ns

Note 1: Parameter guaranteed, but not tested.

FIG. 2

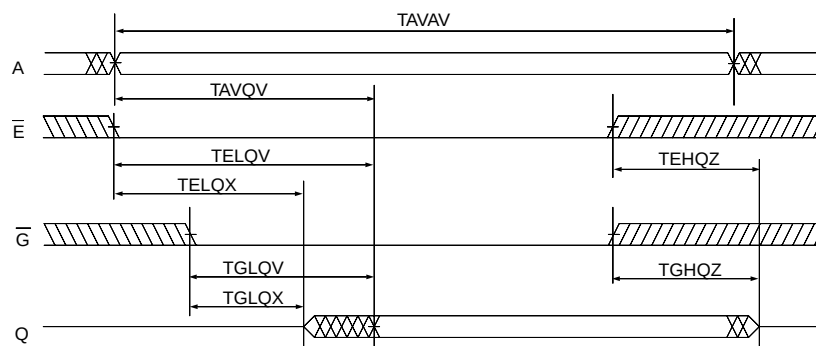
READ CYCLE 1 - $\overline{W}$ HIGH, $\overline{G}$, $\overline{E}$ LOW



9G361024C Rd Cyc1

FIG. 3

READ CYCLE 2 - $\overline{W}$ HIGH



9G361024C Rd Cyc2



AC CHARACTERISTICS WRITE CYCLE

Parameter	Symbol		15ns		20ns		25ns		Units
	JEDEC	Alt.	Min	Max	Min	Max	Min	Max	
Write Cycle Time	TAVAV	TWC	15		20		25		ns
Chip Enable to End of Write	TELWH	TCW	12		15		20		ns
	TWLEH	TCW	12		15		20		ns
Address Setup Time	TAVWL	TAS	0		0		0		ns
	TAVEL	TAS	0		0		0		ns
Address Valid to End of Write	TAVWH	TAW	12		15		20		ns
	TAVEH	TAW	12		15		20		ns
Write Pulse Width	TWLWH	TWP	12		15		20		ns
	TELEH	TWP	12		15		20		ns
Write Recovery Time	TWHAX	TWR	0		0		0		ns
	TEHAX	TWR	0		0		0		ns
Data Hold Time	TWHDX	TDH	3		3		0		ns
	TEHDX	TDH	3		3		0		ns
Write to Output in High Z (1)	TWLQZ	TWHZ	0	8	0	8	0	12	ns
Data to Write Time	TDVWH	TDW	10		12		15		ns
	TDVEH	TDW	10		12		15		ns
Output Active from End of Write (1)	TWHQX	TWLZ	3		3		3		ns

Note 1: Parameter guaranteed, but not tested.

FIG. 4

WRITE CYCLE 1 - $\overline{W}$ CONTROLLED

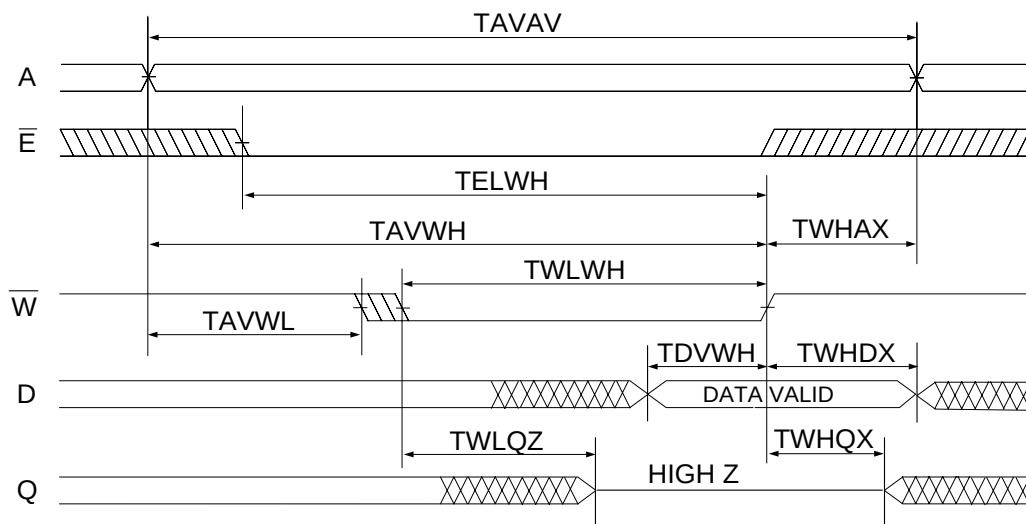
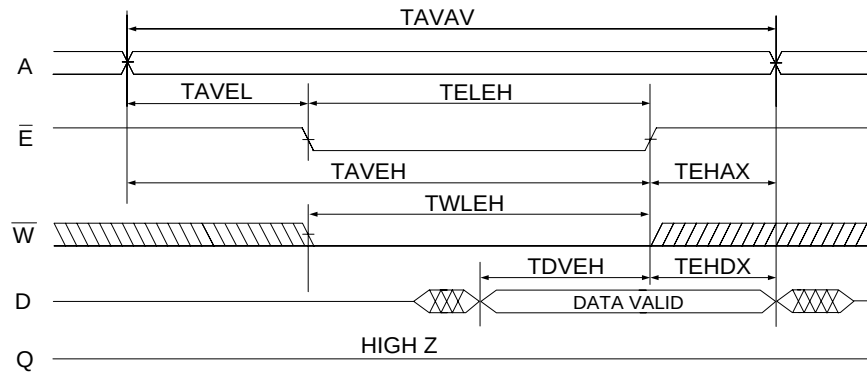




FIG. 5

WRITE CYCLE 2 - $\bar{E}$ CONTROLLED



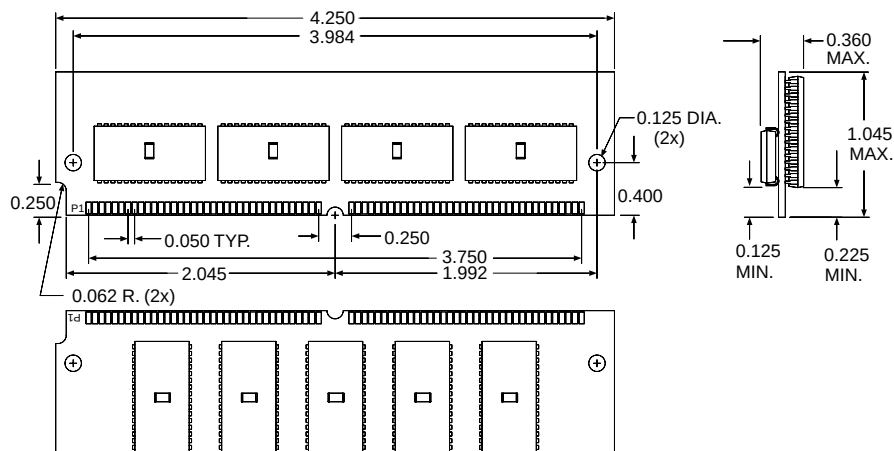
9G361024C Write Cyc2

ORDERING INFORMATION

Part Number	Speed (ns)	Package No.
EDI9G361024C15MNC	15	402
EDI9G361024C20MNC	20	402
EDI9G361024C25MNC	25	402

PACKAGE DESCRIPTION

PACKAGE NO. 402: 72 LEAD SIMM



9G361024C Pkg.

ALL DIMENSIONS ARE IN INCHES