



# 512Kx32 Static RAM CMOS, High Speed Module

## FEATURES

- 512Kx32 bit CMOS Static
- Random Access Memory
  - Access Times: 15, 20, and 25ns
  - Individual Byte Selects
  - Fully Static, No Clocks
  - TTL Compatible I/O
- High Density Package
  - 72 Pin ZIP, No. 173
  - 72 lead SIMM, No. 174 (Gold Option)
  - Common Data Inputs and Outputs
- Single +5V ( $\pm 10\%$ ) Supply Operation

Note: Consult factory for availability of:

- RoHS compliant products
- Vendor source control options
- Industrial temperature option

## DESCRIPTION

The EDI8F32512C is a high speed 16 megabit Static RAM module organized as 512K words by 32 bits. This module is constructed from four 512Kx8 Static RAMs in SOJ packages on an epoxy laminate (FR4) board.

Four chip enables (E0-E3) 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 selects.

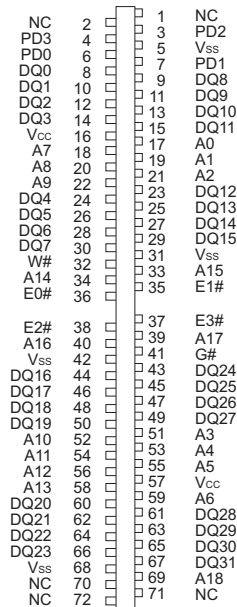
The EDI8F32512C is offered in 72 pin ZIP and 72 lead SIMM packages, which enable 16 megabits of memory to be placed in less than 1.3 square inches of board space.

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.

Pins PD1- PD4, are used to identify module memory density in applications where alternate modules can be interchanged.

**FIG. 1**

**Pin Configurations and Block Diagram**

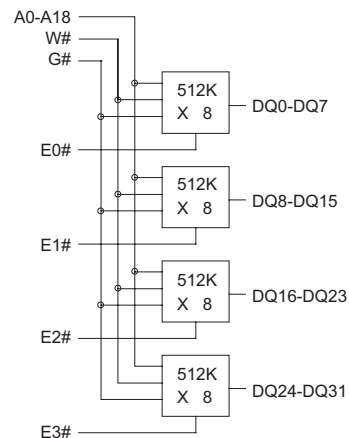


PD0, PD1, PD3= OPEN  
PD2= V<sub>SS</sub>

8G32512C Pin Config.

**Pin Names**

A0-A18	Address Inputs
E0#-E3#	Chip Enables
W#	Write Enable
G#	Output Enable
DQ0-DQ31	Common Data Input/Output
V <sub>CC</sub>	Power (+5V $\pm 10\%$ )
V <sub>SS</sub>	Ground
NC	No Connection <sup>a</sup>



8G32512C Blk. Dia.

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**ABSOLUTE MAXIMUM RATINGS\***

Voltage on any pin relative to V <sub>SS</sub>	-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	5.0 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	V <sub>CC</sub>	4.5	5.0	5.5	V
Supply Voltage	V <sub>SS</sub>	0	0	0	V
Input High Voltage	V <sub>IH</sub>	2.2	--	6.0	V
Input Low Voltage	V <sub>IL</sub>	-0.3	--	0.8	V

**AC TEST CONDITIONS**

Input Pulse Levels	V <sub>SS</sub> 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	I <sub>CC1</sub>	W#, E# = V <sub>IL</sub> , I/O = 0mA, Min Cycle			800	mA
Standby (TTL) Power Supply Current	I <sub>CC2</sub>	E ≥ V <sub>IH</sub> , V <sub>IN</sub> ≥ V <sub>IL</sub> or V <sub>IN</sub> ≥ V <sub>IH</sub>			300	mA
Full Standby Power Supply Current CMOS	I <sub>CC3</sub>	E ≥ V <sub>CC</sub> -0.2V V <sub>IN</sub> ≥ V <sub>CC</sub> =0.2V or V <sub>IN</sub> ≥ 0.2V			80	mA
Input Leakage Current	I <sub>LI</sub>	V <sub>IN</sub> = 0V to V <sub>CC</sub>	--	--	±20	µA
Output Leakage Current	I <sub>LO</sub>	V I/O = 0V TO V <sub>CC</sub>	--	--	±20	µA
Output High Voltage	V <sub>OH</sub>	I <sub>OH</sub> = -4.0mA	2.4	--	--	V
Output Low Voltage	V <sub>OL</sub>	I <sub>OL</sub> = 8.0mA	--	--	0.4	V

\*Typical: TA = 25°C, V<sub>CC</sub> = 5.0V

**TRUTH TABLE**

E#	W#	G#	Mode	Output	Power
H	X	X	Standby	HIGH Z	I <sub>CC2</sub> /I <sub>CC3</sub>
L	H	L	Read	D <sub>OUT</sub>	I <sub>CC1</sub>
L	L	X	Write	D <sub>IN</sub>	I <sub>CC1</sub>
L	H	H	Output Deselect	HIGH Z	I <sub>CC1</sub>

**CAPACITANCE**

(f=1.0MHz, V<sub>IN</sub>=V<sub>CC</sub> or V<sub>SS</sub>)

Parameter	Sym	Max	Unit
Address Lines	CI	45	pF
Data Lines	CD/Q	20	pF
Chip Enable Line	CC	20	pF
Write Line	CN	45	pF

These parameters are sampled, not 100% tested.



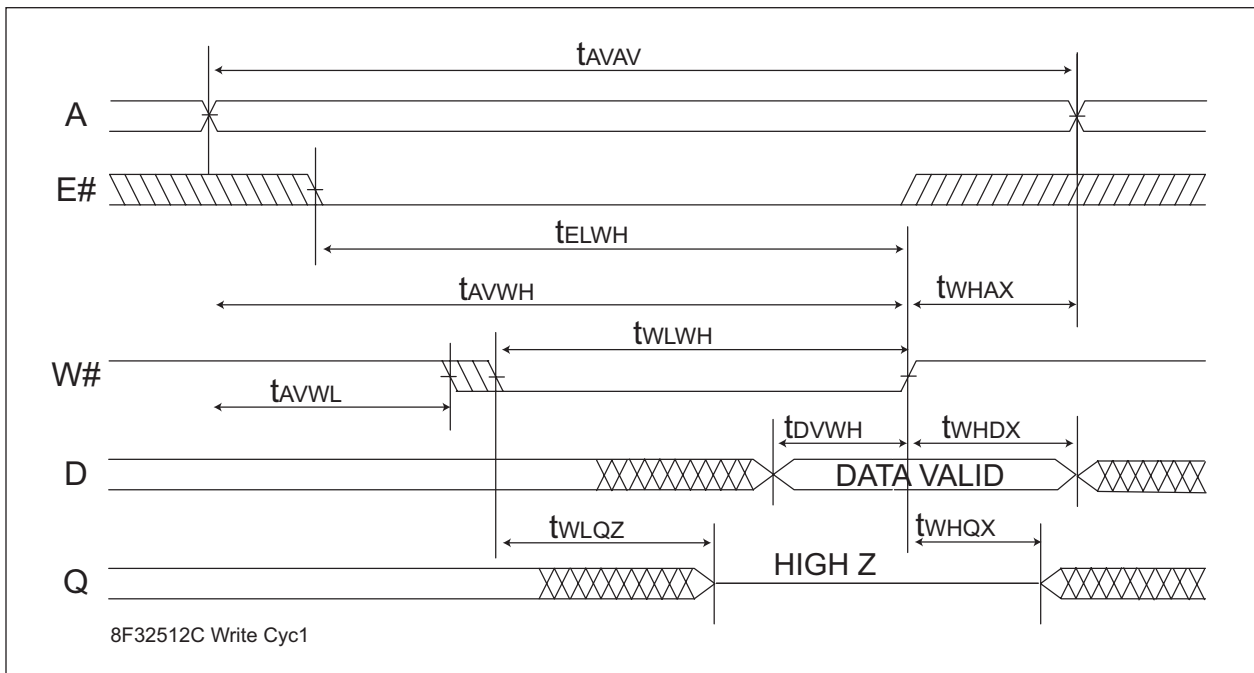


**AC CHARACTERISTICS WRITE CYCLE**

Parameter	Symbol		15ns		20ns		25ns		Units
	JEDEC	Alt.	Min	Max	Min	Max	Min	Max	
Write Cycle Time	$t_{AVAV}$	TWC	15		20		25		ns
Chip Enable to End of Write	$t_{ELWH}$	TCW	8		15		20		ns
	$t_{WLEH}$	TCW	8		15		20		ns
Address Setup Time	$t_{AVWL}$	TAS	0		0		0		ns
	$t_{AVEL}$	TAS	0		0		0		ns
Address Valid to End of Write	$t_{AVWH}$	TAW	8		15		15		ns
	$t_{AHEH}$	TAW	8		15		15		ns
Write Pulse Width	$t_{WLWH}$	TWP	10		15		15		ns
	$t_{ELEH}$	TWP	10		15		15		ns
Write Recovery Time	$t_{WHAX}$	TWR	0		0		0		ns
	$t_{EHAX}$	TWR	0		0		0		ns
Data Hold Time	$t_{WHDX}$	TDH	0		0		0		ns
	$t_{EHDX}$	TDH	0		0		0		ns
Write to Output in High Z (1)	$t_{WLQZ}$	TWHZ	0	6	0	8	0	12	ns
Data to Write Time	$t_{DVWH}$	TDW	7		9		10		ns
	$t_{DVEH}$	TDW	7		9		10		ns
Output Active from End of Write (1)	$t_{WHQX}$	TWLZ	3		3		3		ns

Notes: 1. Parameter guaranteed, but not tested.

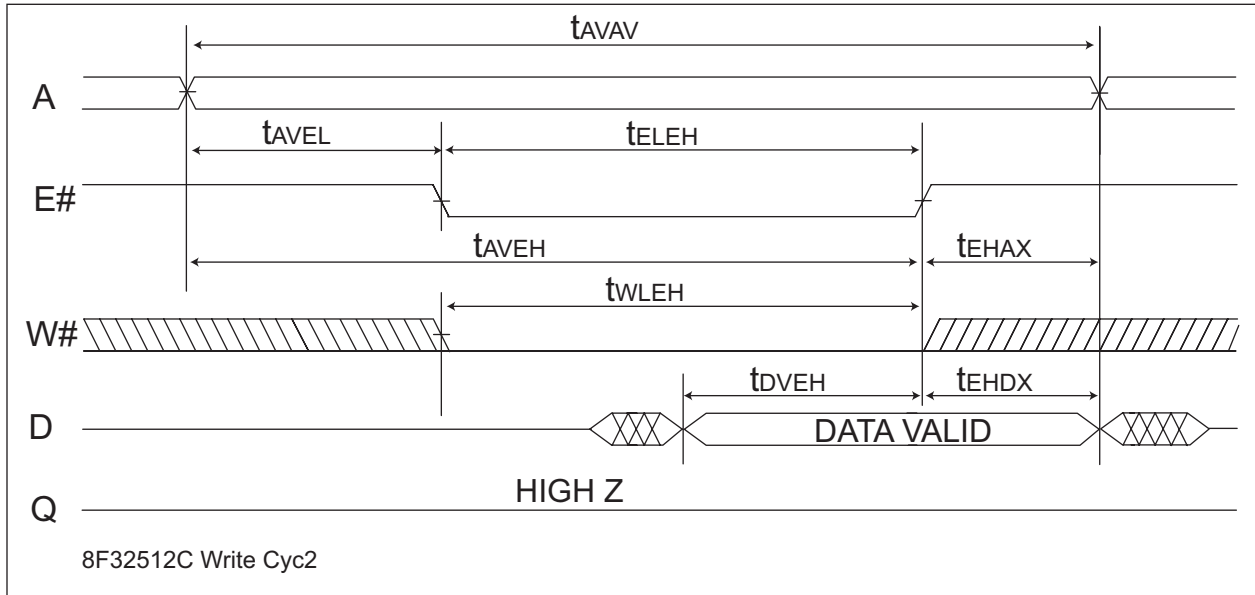
**FIG. 4**  
**WRITE CYCLE 1 - W# CONTROLLED**



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FIG. 5  
WRITE CYCLE 2 - E# CONTROLLED





**ORDERING INFORMATION**

Part Number	Speed (ns)	Package No.
EDI8F32512C15MMC	15	174
EDI8F32512C20MMC	20	174
EDI8F32512C25MMC	25	174

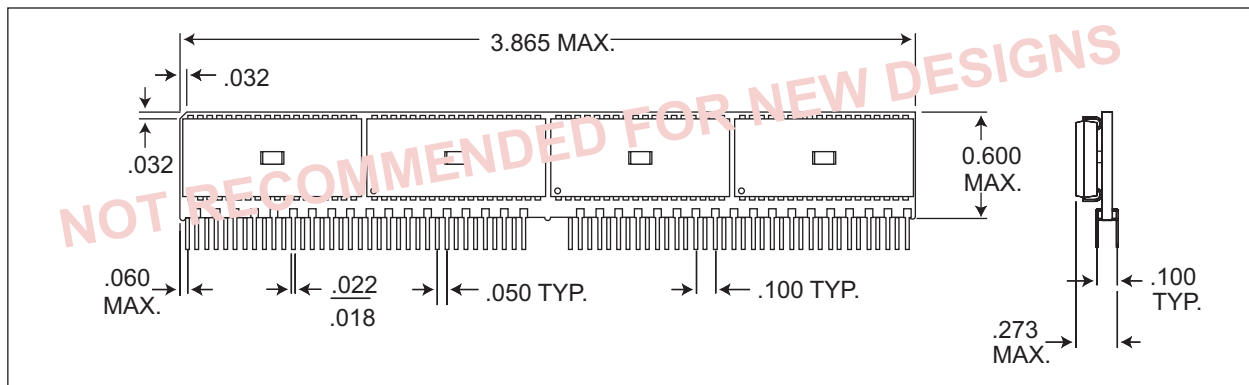
Part Number	Speed (ns)	Package No.
EDI8F32512C15MZC	15	173
EDI8F32512C20MZC	20	173
EDI8F32512C25MZC	25	173

NOTES:

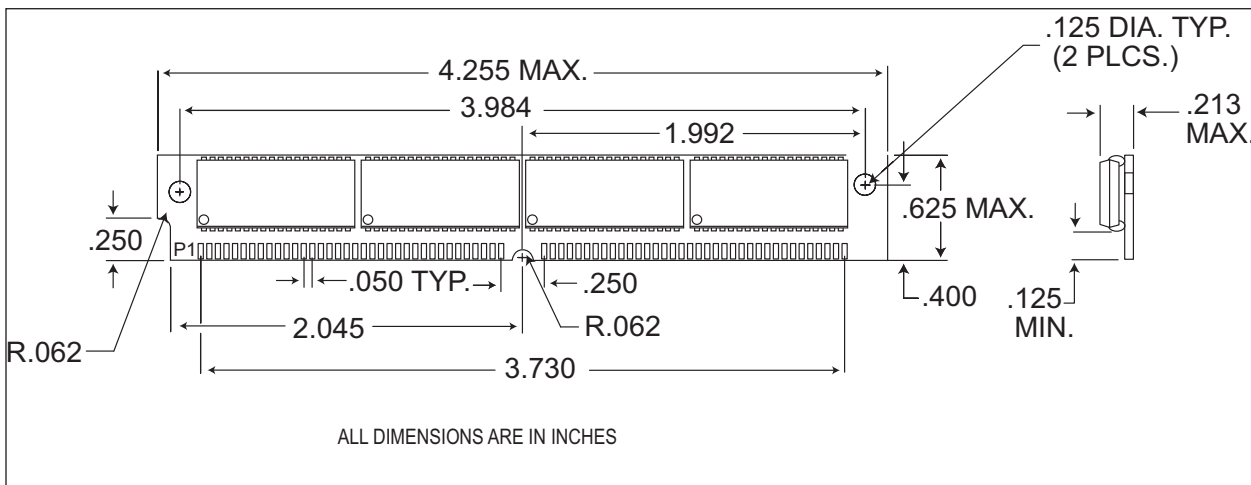
- Consult Factory for availability of RoHS compliant products. (indicated with "G" at the end of the part number)
- Vendor specific part numbers are used to provide memory components source control. The place holder for this is shown as lower case "x" in the part numbers above and is to be replaced with the respective vendors code. Consult factory for qualified sourcing options. (M = Micron, S = Samsung & consult factory for others)
- Consult factory for availability of industrial temperature (-40°C to 85°C) option
- To order gold SIMM option, change from "EDI8F" to "EDI8G".

**PACKAGE DESCRIPTION**

**PACKAGE NO. 173: 72 PIN ZIP**



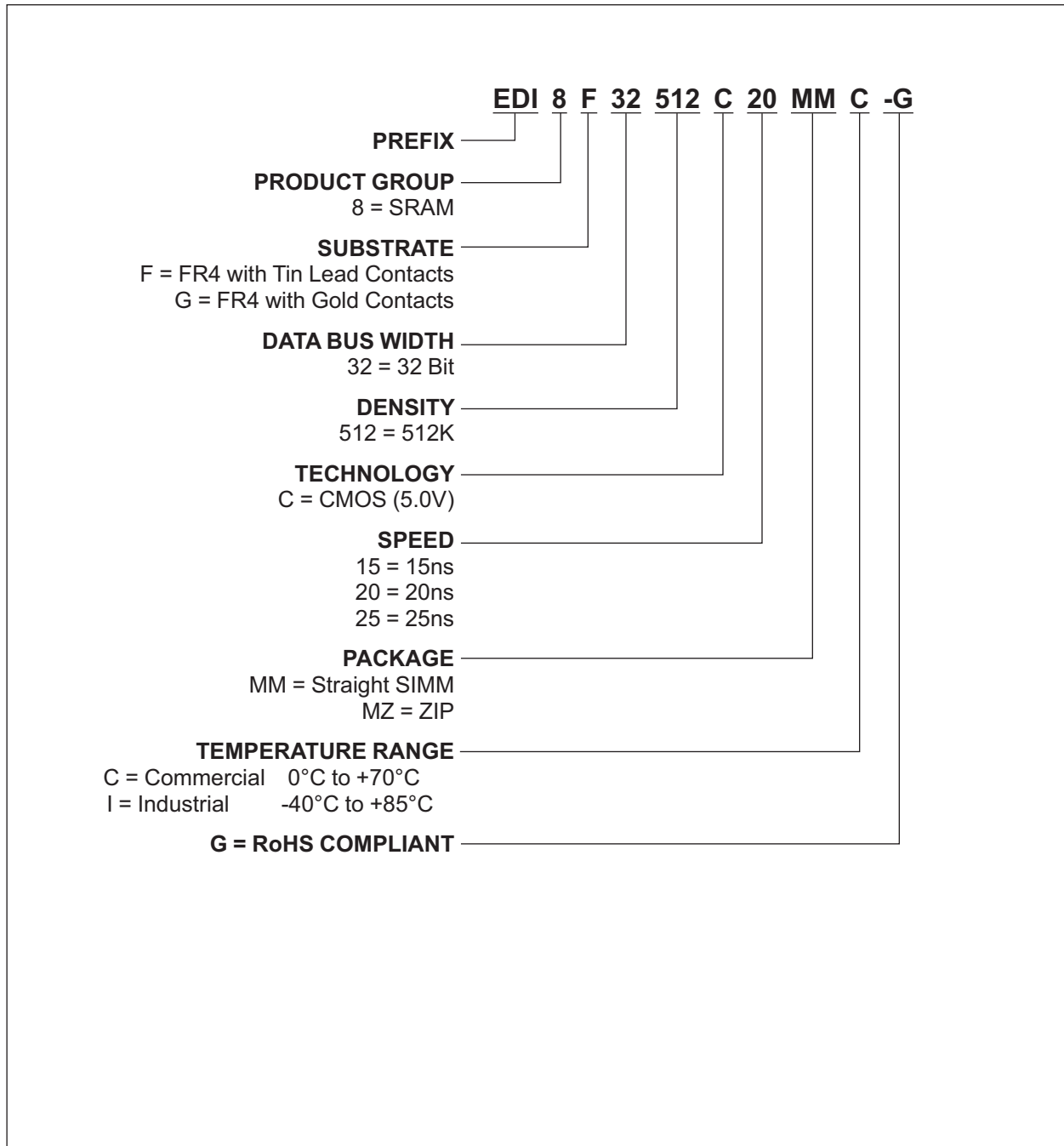
**PACKAGE NO. 174: 72 LEAD SIMM**



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**PART NUMBERING GUIDE**





**Document Title**

512Kx32 Static Ram CMOS, High Speed Module

**Revision History**

<b>Rev #</b>	<b>History</b>	<b>Release Date</b>	<b>Status</b>
Rev 9	9.1 Added RoHS compliance option 9.2 Offer vendor source control 9.3 Provide industrial temperature option 9.4 Added part number guide 9.5 Added document title page	March 2006	Final