

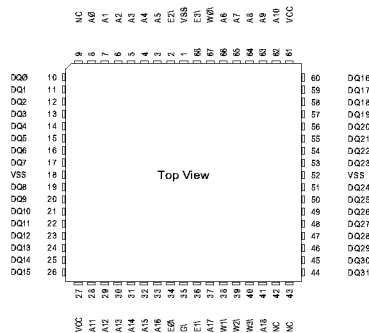
Features

- 512Kx32 CMOS Static RAM
- Fast Access Times: 12, 15 and 20ns
- TTL Compatible Inputs and Outputs
- Fully Static, No Clocks
- Surface Mount Package
 - 68 Lead PLCC, No. 99 JEDEC MO-47AE
 - Small Footprint, 0.990 Sq. In.
 - Multiple Ground Pins for Maximum Noise Immunity
- Single +5V (±5%) Supply Operation

512Kx32 CMOS High Speed Static RAM

The ED18LM32513C is a high-speed 16-Megabit static RAM device with access times of 12, 15 and 20ns over the Commercial, Industrial and Military temperature range. The device allows the user to capitalize on the cost advantages of a plastic component while not sacrificing all of the reliability available in a full military component. Extended temperature testing is performed using the same test patterns as those used on EDI's ceramic military product line. EDI fully characterizes the devices to determine the proper test patterns required for testing at the temperature extremes. This is a critical process, since the operating characteristics of the devices change when they are operated beyond the commercial temperature range. Users of EDI's ruggedized plastic components will benefit from EDI's extensive experience in characterizing SRAMs for use in military systems.

Pin Configurations and Block Diagram

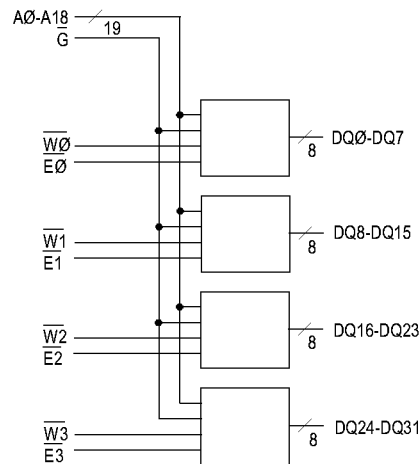


Pin Names

A0-A18	Address Inputs
$\overline{E0}$ - $\overline{E3}$	Chip Enable
$\overline{W0}$ - $\overline{W3}$	Write Enable
\overline{G}	Output Enable
DQ0-DQ31	Data Input/Output
VCC	Power (+5V±5%)
VSS	Ground
NC	No Connect

The ED18LM32512C can also be used as a direct replacement for EDI's ceramic 68-pin JLCC product, the ED18C32513CA. The plastic PLCC product provides up to 50% in space savings, 50% weight reduction and 50% savings in capacitance loading. The ED18LM32513C also provides a cost effective alternative for COTs programs.

Note: Solder Reflow Temperature should not exceed 260 °C for 10 seconds.



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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
Military	-55 °C to +125 °C
Storage Temperature	-55 °C to +150 °C
Power Dissipation	5.0 Watts
Output Current	20 mA
Junction Temperature, TJ	175 °C

*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	4.75	5.0	5.25	V
Supply Voltage	VSS	0	0	0	V
Input High Voltage	VIH	2.2	--	VCC+0.5	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	Figure 1

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

Figure 1

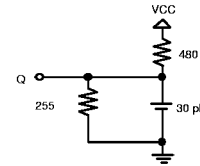
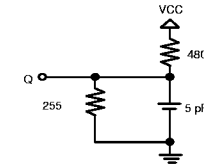


Figure 2



DC Electrical Characteristics

Parameter	Sym	Conditions	Min	Max	Units
Operating Power Supply Current	ICC1	$\bar{W}=VIL, I/O=0mA,$ Min Cycle		800	20 mA
Standby (TTL) Supply Current	ICC2	$\bar{E} \geq VIH, VIN=VIL$ or $VIN \geq VIH, f=0MHz$		200	200 mA
Full Standby CMOS Supply Current	ICC3	$\bar{E} \geq VCC-0.2V$ $VIN \geq VCC-0.2V$ or $VIN \leq 0.2V$		40	40 mA
Input Leakage Current	ILI	$VIN = 0V$ to VCC		± 10	μA
Output Leakage Current	ILO	$V I/O = 0V$ to VCC		± 10	μA
Output High Voltage	VOH	$IOH = -4.0mA$	2.4		V
Output Low Voltage	VOL	$IOL = 8.0mA$		0.4	V

Truth Table

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

Capacitance

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

Parameter	Sym	Max	Unit
Address Lines	CI	30	pF
Data Lines	CD/Q	10	pF
Write & Output Enable Lines	\bar{W}, \bar{G}	30	pF
Chip Enable Lines	E0-E3	8	pF

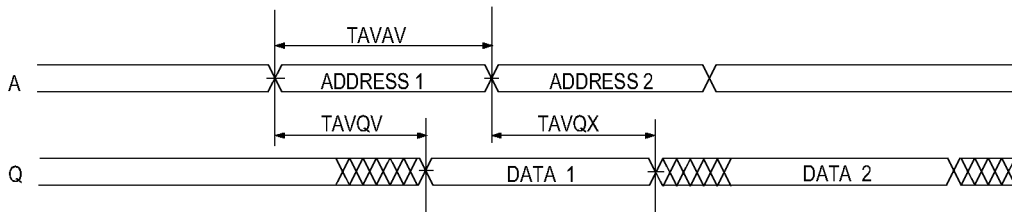
EDI8LM32513C-RP
512Kx32 SRAM
Ruggedized Plastic

AC Characteristics Read Cycle

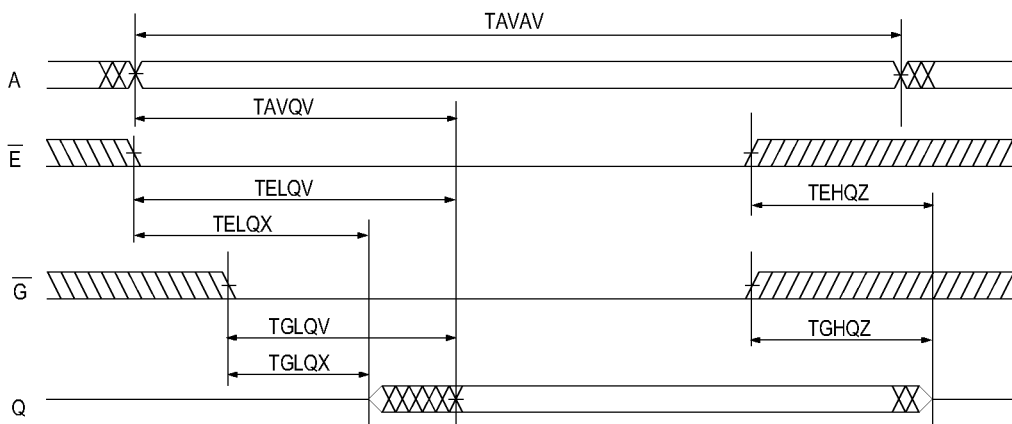
Parameter	Symbol		12ns		15ns		20ns		Units
	JEDEC	Alt.	Min	Max	Min	Max	Min	Max	
Read Cycle Time	TAVAV	TRC	12		15		20		ns
Address Access Time	TAVQV	TAA		12		15		20	ns
Chip Enable Access Time	TELQV	TACS		12		15		20	ns
Chip Enable to Output in Low Z (1)	TELQX	TCLZ	3		3		3		ns
Chip Disable to Output in High Z (1)	TEHQZ	TCHZ		6		7		9	ns
Output Hold from Address Change	TAVQX	TOH	3		3		3		ns
Output Enable to Output Valid	TGLQV	TOE		6		7		9	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		6		7		9	ns

*Advanced Information

Read Cycle 1 - \overline{W} High, \overline{G} , \overline{E} Low



Read Cycle 2 - \overline{W} High

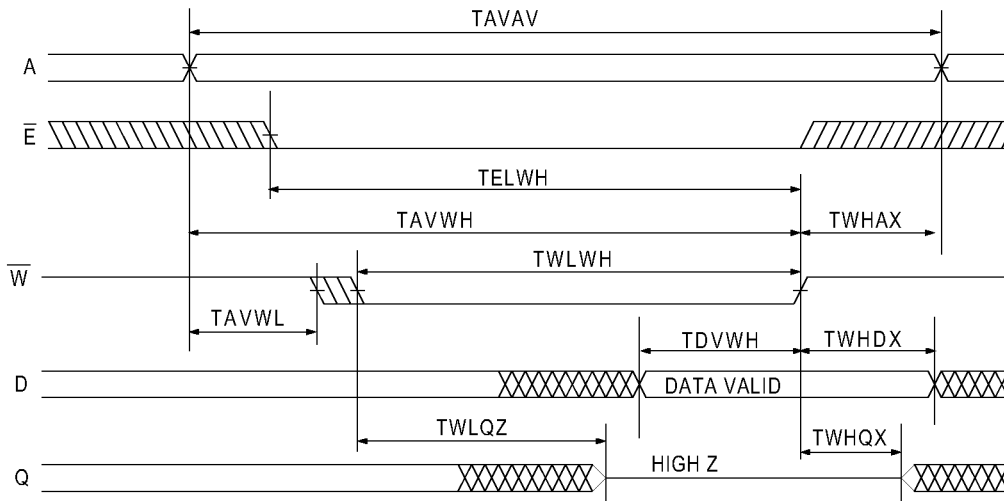


AC Characteristics Write Cycle

Parameter	Symbol		12ns		15ns		20ns		Units
	JEDEC	Alt	Min	Max	Min	Max	Min	Max	
Write Cycle Time	TAVAV	TWC	12		15		20		ns
Chip Enable to End of Write	TELWH	TCW	8		10		12		ns
	TELEH	TCW	8		10		12		ns
Address Setup Time	TAVWL	TAS	0		0		0		ns
	TAVEL	TAS	0		0		0		ns
Address Valid to End of Write	TAVWH	TAW	8		10		12		ns
	TAVEH	TAW	8		10		12		ns
Write Pulse Width	TWLWH	TWP	8		10		12		ns
	TWLEH	TWP	10		12		14		ns
Write Recovery Time	TWHAX	TWR	0		0		0		ns
	TEHAX	TWR	0		0		0		ns
Data Hold Time	TWHDX	TDH	0		0		0		ns
	TEHDX	TDH	0		0		0		ns
Write to Output in High Z (1)	TWLQZ	TWHZ	0	6	0	7	0	9	ns
Data to Write Time	TDVWH	TDW	6		7		9		ns
	TDVEH	TDW	6		7		9		ns
Output Active from End of Write (1)	TWHQX	TWLZ	3		3		3		ns

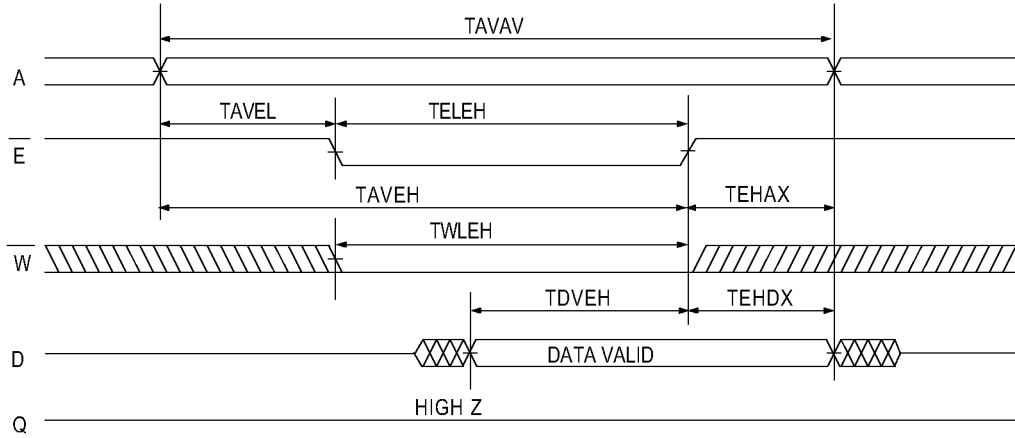
Note 1: Parameter guaranteed, but not tested.

Write Cycle 1 - \bar{W} Controlled



EDI8LM32513C-RP
512Kx32 SRAM
Ruggedized Plastic

Write Cycle 2 - \bar{E} Controlled



Ordering Information

Commercial (0 °C to +70 °C)

Part Number	Speed (ns)	Package No.
EDI8LM32513C12AC	12	99
EDI8LM32513C15AC	15	99
EDI8LM32513C20AC	20	99

Industrial (-40 °C to +85 °C)

Part Number	Speed (ns)	Package No.
EDI8LM32513C15AI	15	99
EDI8LM32513C20AI	20	99

Military (-55 °C to +125 °C)

Part Number	Speed (ns)	Package No.
EDI8LM32513C15AM	15	99
EDI8LM32513C20AM	20	99

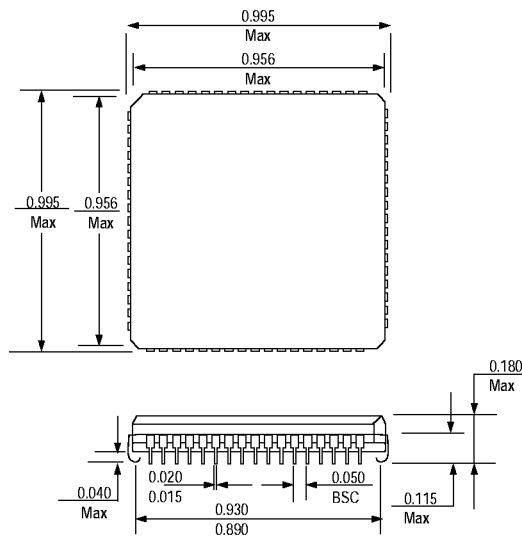
Package Description

Package No. 99
68 Lead PLCC
JEDEC MO-47AE

Weight = 4.2g

Theta J_A = 40 °C/W

Theta J_c = 15 °C/W



Coplanarity (lowest lead to highest lead) 0.004

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