Features

512Kx32 CMOS Static RAM

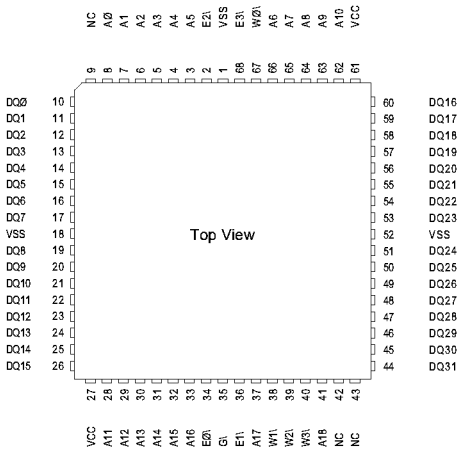
- Fast Access Times: 12, 15 and 20ns
- Individual Byte Enables
- User configurable Organization with Minimal Additional Logic
- Master Output Enable and Write Control
- TTL Compatible Inputs and Outputs
- Fully Static, No Clocks

Surface Mount Package

- 68 Lead PLCC, No. 99 JEDEC M0-47AE
- Small Footprint, 0.990 Sq. In.
- Multiple Ground Pins for Maximum Noise Immunity

Single +3.3V (±5%) Supply Operation

Pin Configurations and Block Diagram



Pin Names

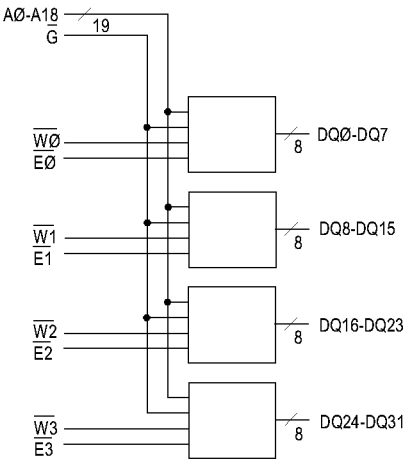
AØ-A18	Address Inputs
EØ-E3	Chip Enable
W0-3	Write Enable
G	Output Enable
DQØ-DQ31	Common Data Input/Output
VCC	Power (+3.3V±5%)
VSS	Ground
NC	No Connect

512Kx32 CMOS High Speed Static RAM

The EDI8LM32513V 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.

The EDI8LM32513V can also be used as a direct replacement for EDI's ceramic 68-pin JLCC product, the EDI8C32512CA. The plastic PLCC product provides up to 50% in space savings, 50% weight reduction and 50% savings in capacitance loading. The EDI8LM32513V also provides a cost effective alternative for COTs programs.

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



Electronic Designs Incorporated
• One Research Drive • Westborough, MA 01581 USA • 508-366-5151 • FAX 508-836-4850 •
Electronic Designs Europe Ltd. • Shelley House, The Avenue • Lightwater, Surrey GU18 5RF
United Kingdom • 01276 472637 • FAX: 01276 473748
http://www.electronic-designs.com

Absolute Maximum Ratings*

Voltage on any pin relative to VSS	-0.5V to 4.6V
Operating Temperature TA (Ambient)	
Commercial	0 ℃ to + 70 ℃
Industrial	-40 ℃ to +85 ℃
Military	-55 ℃ to +150 ℃
Storage Temperature	-55 ℃ to +125 ℃
Power Dissipation	2.5 Watts
Output Current.	20 mA
Junction Temperature, TJ	175 ℃

*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	3.135	3.3	3.465	V
Supply Voltage	VSS	0	0	0	V
Input High Voltage	VIH	2.2	--	VCC+0.3	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

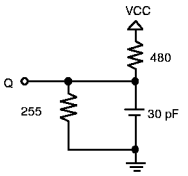
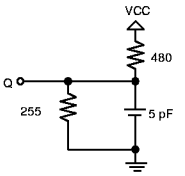


Figure 2



DC Electrical Characteristics

Parameter	Sym	Conditions	Min	Max 12/15	Max 20	Units mA
Operating Power Supply Current	ICC1	$\overline{W}$= VIL, II/O = 0mA, Min Cycle		720	640	mA
Standby (TTL) Supply Current	ICC2	$\overline{E} \geq$ VIH, VIN $\leq$ VIL or VIN $\geq$ VIH, f=ØMHz		200	200	mA
Full Standby CMOS Supply Current	ICC3	$\overline{E} \geq$ VCC-0.2V VIN $\geq$ VCC-0.2V or VIN - 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 Volltage	VOH	IOH = -4.0mA	2.4			V
Output Low Voltage	VOL	IOL = 8.0mA		0.4		V

Truth Table

$\overline{G}$	$\overline{E}$	$\overline{W}$	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

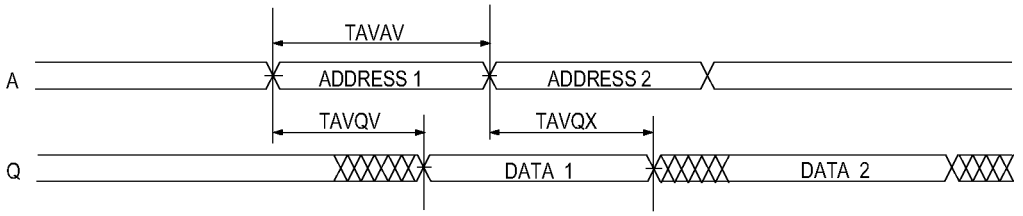
(f=1.0MHz, VIN=VCC or VSS)

Parameter	Sym	Max	Unit
Address Lines	CI	30	pF
Data Lines	CD/Q	10	pF
Write & Output Enable Lines	$\overline{W}$, $\overline{G}$	30	pF
Chip Enable Lines	$\overline{E}$Ø-$\overline{E}$3	8	pF

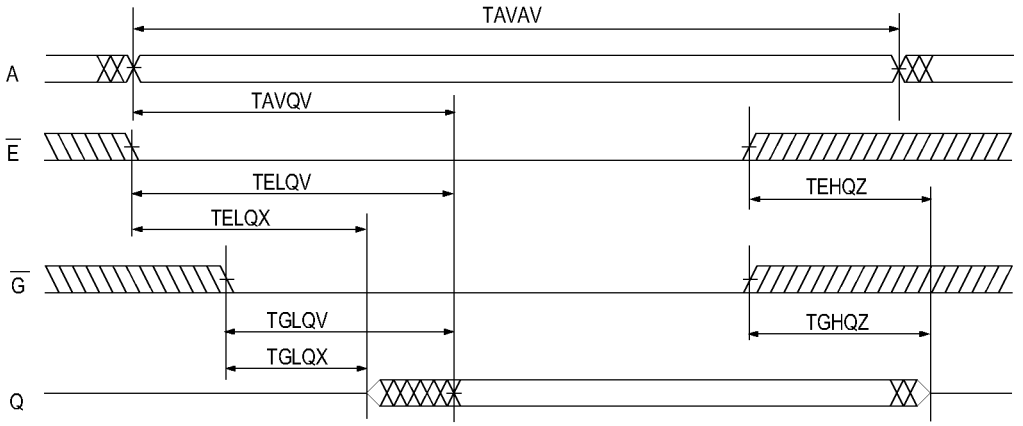
AC Characteristics Read Cycle

	Symbol		12ns		15ns		20ns		
Parameter	**JEDEC**	**Alt.**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Units**
Read Cycle Time	TAVAV	TRC	12		15		20		ns
Address Access Time	TAVQV	TAA		12		15		20	ns
Chip Enable Access Time	TELQV	TACS		10		12		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	3		3		3		ns
Output Disable to Output in High Z(1)	TGHQZ	TOHZ		6		7		9	ns

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



Read Cycle 2 - $\overline{W}$ High

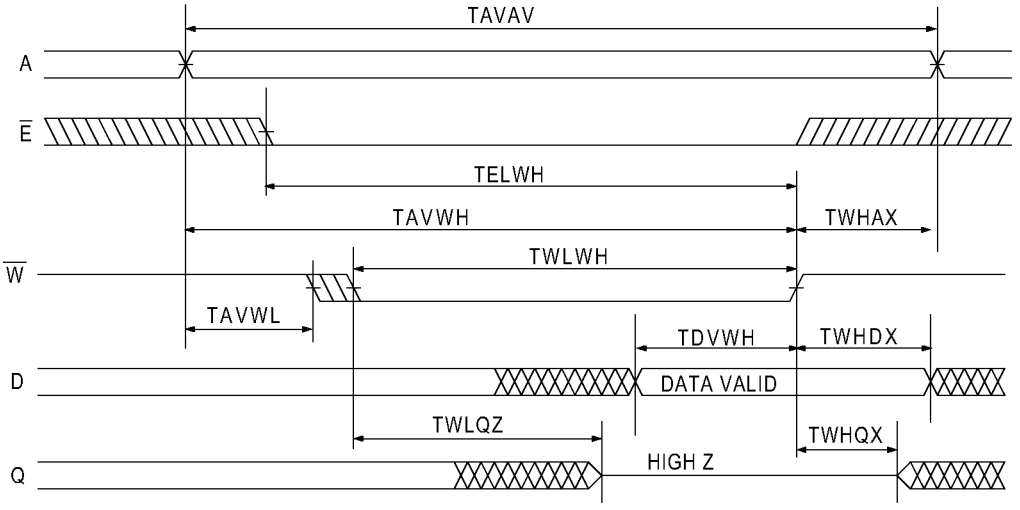


AC Characteristics Write Cycle

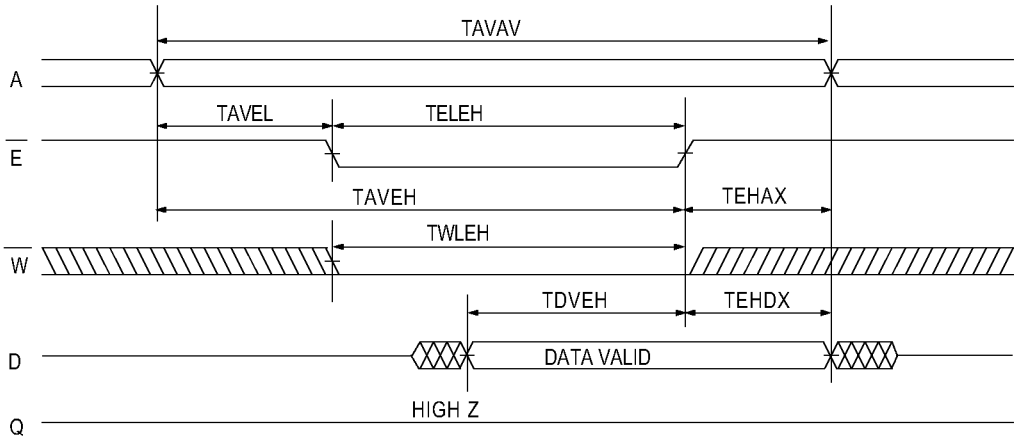
Parameter	Symbol JEDEC	Alt.	12ns Min	Max	15ns Min	Max	20ns Min	Max	Units
Write Cycle Time	TAVAV	TWC	12		15		20		ns
Chip Enable to End of Write	TELWH	TCW	8		10		12		ns
	TELEH	TCW	8		10		12		ns
Address Setup Time	TAVWL	TAS	0		0		0		ns
	TAVEL	TAS	0		0		0		ns
Address Valid to End of Write	TAVWH	TAW	8		10		12		ns
	TAVEH	TAW	8		10		12		ns
Write Pulse Width	TWLWH	TWP	8		10		12		ns
	TWLEH	TWP	8		10		12		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 - $\overline{W}$ Controlled



Write Cycle 2 - $\overline{E}$ Controlled



Ordering Information

Commercial (0 ℃ to+70 ℃)

Part Number	Speed (ns)	Package No.
EDI8LM32513V12AC	12	99
EDI8LM32513V15AC	15	99
EDI8LM32513V20AC	20	99

Industrial (-40 ℃ to+85 ℃)

Part Number	Speed (ns)	Package No.
EDI8LM32513V15AI	15	99
EDI8LM32513V20AI	20	99

Military (-55 ℃ to+125 ℃)

Part Number	Speed (ns)	Package No.
EDI8LM32513V15AM	15	99
EDI8LM32513V20AM	20	99

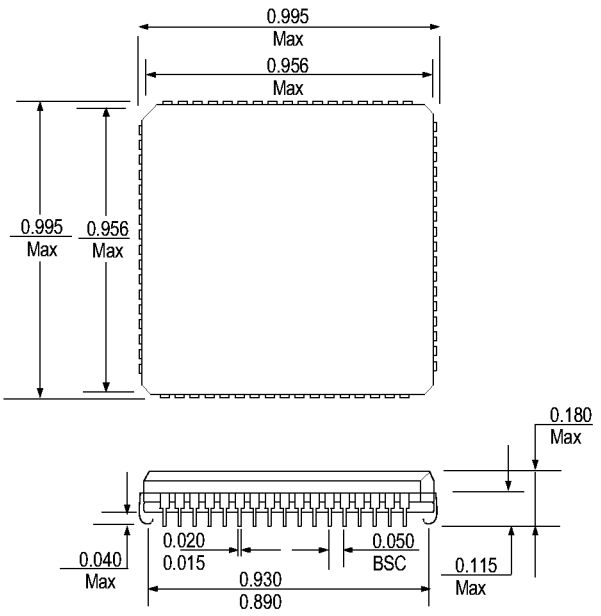
Package Description

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

Theta Ja = 40 ℃/W

Theta Jc = 15 ℃/W

Weight = 4.2g



Coplanarity (lowest lead to highest lead) 0.004 max.