

512Kx8 Monolithic SRAM, SMD 5962-95600

FEATURES

- Access Times of 15, 17, 20, 25, 35, 45, 55ns
- Data Retention Function (LPA version)
- TTL Compatible Inputs and Outputs
- Fully Static, No Clocks
- Organized as 512Kx8
- Commercial, Industrial and Military Temperature Ranges
- 32 lead JEDEC Approved Evolutionary Pinout
 - Ceramic Sidebrazed 600 mil DIP (Package 9)
 - Ceramic Sidebrazed 400 mil DIP (Package 326)
 - Ceramic 32 pin Flatpack (Package 344)
 - Ceramic Thin Flatpack (Package 321)
 - Ceramic SOJ (Package 140)
- 36 lead JEDEC Approved Revolutionary Pinout
 - Ceramic Flatpack (Package 316)
 - Ceramic SOJ (Package 327)
 - Ceramic LCC (Package 502)
- Single +5V (±10%) Supply Operation

The EDI88512CA is a 4 megabit Monolithic CMOS Static RAM.

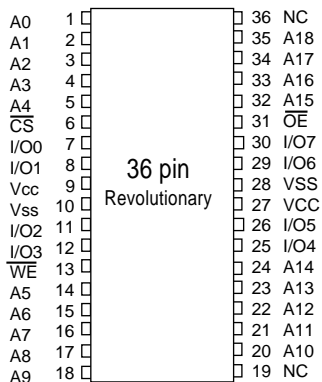
The 32 pin DIP pinout adheres to the JEDEC evolutionary standard for the four megabit device. All 32 pin packages are pin for pin upgrades for the single chip enable 128K x 8, the EDI88128CS. Pins 1 and 30 become the higher order addresses.

The 36 pin revolutionary pinout also adheres to the JEDEC standard for the four megabit device. The center pin power and ground pins help to reduce noise in high performance systems. The 36 pin pinout also allows the user an upgrade path to the future 2Mx8.

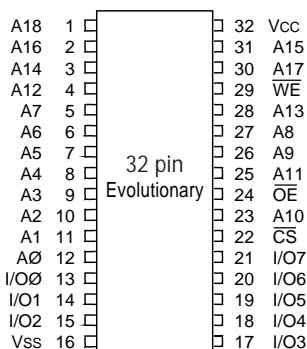
A Low Power version with Data Retention (EDI88512LPA) is also available for battery backed applications. Military product is available compliant to Appendix A of MIL-PRF-38535.

FIG. 1 PIN CONFIGURATION

36 PIN TOP VIEW



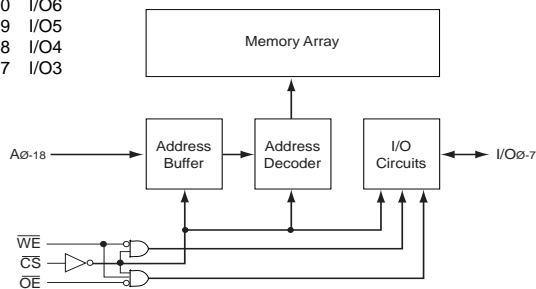
32 PIN TOP VIEW



PIN DESCRIPTION

I/O0-7	Data Inputs/Outputs
A0-18	Address Inputs
WE	Write Enables
CS	Chip Selects
OE	Output Enable
Vcc	Power (+5V ±10%)
Vss	Ground
NC	Not Connected

BLOCK DIAGRAM





ABSOLUTE MAXIMUM RATINGS

Parameter		Unit
Voltage on any pin relative to Vss	-0.5 to 7.0	V
Operating Temperature TA (Ambient)		
Commercial	0 to +70	°C
Industrial	-40 to +85	°C
Military	-55 to +125	°C
Storage Temperature, Plastic	-65 to +150	°C
Power Dissipation	1.5	W
Output Current	20	mA
Junction Temperature, TJ	175	°C

NOTE:

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.

TRUTH TABLE

\overline{OE}	\overline{CS}	\overline{WE}	Mode	Output	Power
X	H	X	Standby	High Z	Icc2, Icc3
H	L	H	Output Deselect	High Z	Icc1
L	L	H	Read	Data Out	Icc1
X	L	L	Write	Data In	Icc1

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	Vcc	4.5	5.0	5.5	V
Supply Voltage	Vss	0	0	0	V
Input High Voltage	VIH	2.2	—	3.0	V
Input Low Voltage	VIL	-0.3	—	+0.8	V

CAPACITANCE

(TA = +25°C)

Parameter	Symbol	Condition	Max	Unit
Address Lines	CI	VIN = Vcc or Vss, f = 1.0MHz	12	pF
Data Lines	Co	VOUT = Vcc or Vss, f = 1.0MHz	14	pF

These parameters are sampled, not 100% tested.

DC CHARACTERISTICS

(Vcc = 5V, TA = -55°C to +125°C)

Parameter	Symbol	Conditions	Min		Max		Units
Input Leakage Current	ILI	VIN = 0V to Vcc	-10	10			µA
Output Leakage Current	ILO	VIO = 0V to Vcc	-10	10			µA
Operating Power Supply Current	Icc1	$\overline{WE}, \overline{CS} = VIL, IIO = 0mA, \text{Min Cycle}$ (17ns) (20 -55ns)	—	250			mA
			—	225			mA
Standby (TTL) Power Supply Current	Icc2	$\overline{CS} \geq VIH, VIN \leq VIL, VIN \geq VIH$	—	60			mA
Full Standby Power Supply Current	Icc3	$\overline{CS} \geq Vcc - 0.2V$ $VIN \geq Vcc - 0.2V \text{ or } VIN \leq 0.2V$	CA	—	25		mA
			LPA	—	20		mA
Output Low Voltage	VOL	IOL = 8.0mA	—	0.4			V
Output High Voltage	VOH	IOH = -4.0mA	2.4	—			V

NOTE: DC test conditions: VIL = 0.3V, VIH = Vcc - 0.3V

AC TEST CONDITIONS

Figure 1

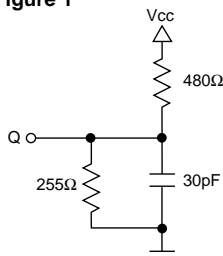
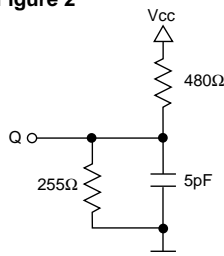


Figure 2



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 tEHOZ, tGHOZ and tWLOZ, CL = 5pF Figure 2)



AC CHARACTERISTICS – READ CYCLE

(V_{CC} = 5.0V, V_{SS} = 0V, T_A = -55°C to +125°C)

Parameter	Symbol		15ns		17ns		20ns		25ns		35ns		45ns		55ns		Units
	JEDEC	Alt.	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Read Cycle Time	tAVAV	tRC	15		17		20		25		35		45		55		ns
Address Access Time	tAVQV	tAA		15		17		20		25		35		45		55	ns
Chip Enable Access Time	tELOV	tACS		15		17		20		25		35		45		55	ns
Chip Enable to Output in Low Z (1)	tELOX	tCLZ	2		3		3		3		3		3		3		ns
Chip Disable to Output in High Z (1)	tEHOZ	tCHZ	0	7	0	7	0	8	0	10	0	15	0	20	0	20	ns
Output Hold from Address Change	tAVQX	tOH	0		0		0		0		0		0		0		ns
Output Enable to Output Valid	tGLQV	tOE		8		8		10		12		15		25		30	ns
Output Enable to Output in Low Z (1)	tGLOX	tOLZ	0		0		0		0		0		0		0		ns
Output Disable to Output in High Z(1)	tGHOZ	tOHZ	0	7	0	7	0	8	0	10	0	15	0	20	0	20	ns

1. This parameter is guaranteed by design but not tested.

AC CHARACTERISTICS – WRITE CYCLE

(V_{CC} = 5.0V, V_{SS} = 0V, T_A = -55°C to +125°C)

Parameter	Symbol		15ns		17ns		20ns		25ns		35ns		45ns		55ns		Units
	JEDEC	Alt.	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Write Cycle Time	tAVAV	tWC	15		17		20		25		35		45		55		ns
Chip Enable to End of Write	tELWH	tCW	13		14		15		17		25		30		50		ns
	tELEH	tCW	13		14		15		17		25		30		50		ns
Address Setup Time	tAVWL	tAS	0		0		0		0		0		0		0		ns
	tAVEL	tAS	0		0		0		0		0		0		0		ns
Address Valid to End of Write	tAVWH	tAW	13		14		15		17		25		30		50		ns
	tAVEH	tAW	13		14		15		17		25		30		50		ns
Write Pulse Width	tWLWH	tWP	13		14		15		17		25		30		45		ns
	tWLEH	tWP	13		14		15		17		25		30		45		ns
Write Recovery Time	tWHAX	tWR	0		0		0		0		0		0		0		ns
	tEHAX	tWR	0		0		0		0		0		0		0		ns
Data Hold Time	tWHDX	tDH	0		0		0		0		0		0		0		ns
	tEHDX	tDH	0		0		0		0		0		0		0		ns
Write to Output in High Z (1)	tWLOZ	tWHZ	0	8	0	8	0	8	0	10	0	25	0	30	0	30	ns
Data to Write Time	tDVWH	tDW	8		8		10		12		20		25		40		ns
	tDVEH	tDW	8		8		10		12		20		25		30		ns
Output Active from End of Write (1)	tWHQX	tWLZ	0		0		0		0		0		0		0		ns

1. This parameter is guaranteed by design but not tested.



FIG. 2
TIMING WAVEFORM - READ CYCLE

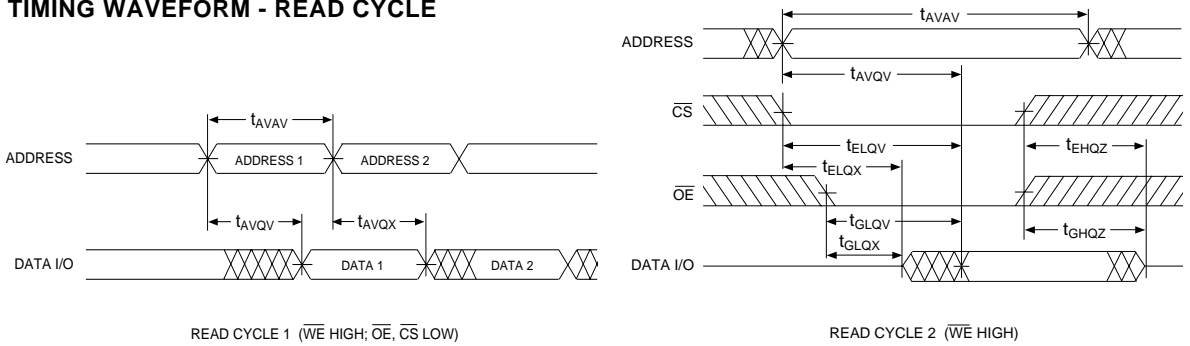


FIG. 3
WRITE CYCLE - \overline{WE} CONTROLLED

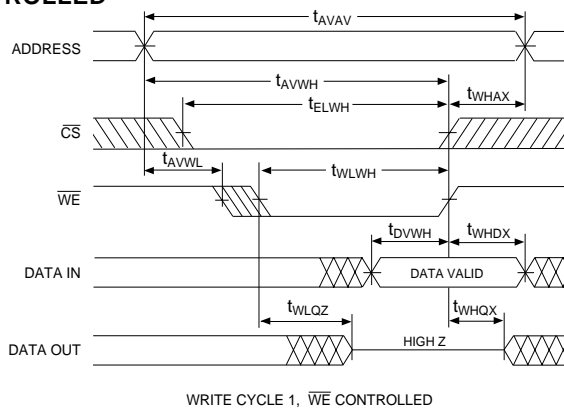
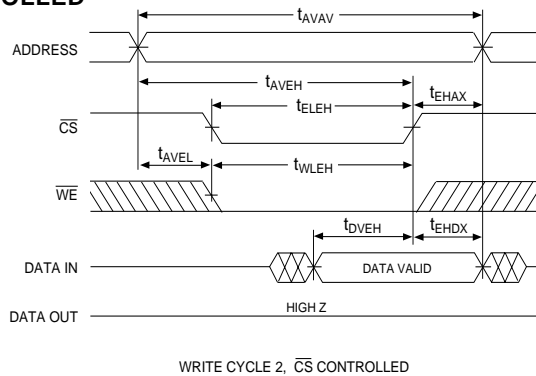


FIG. 4
WRITE CYCLE - \overline{CS} CONTROLLED

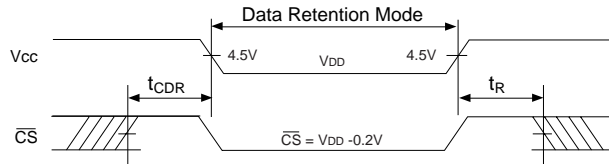




DATA RETENTION CHARACTERISTICS (EDI88512LPA ONLY)
(TA = -55°C to +125°C)

Characteristic Low Power Version only	Sym	Conditions	Min	Typ	Max	Units
Data Retention Voltage	V _{DD}	V _{DD} = 2.0V	2	-	-	V
Data Retention Quiescent Current	I _{CCDR}	$\overline{CS} \geq V_{DD} - 0.2V$	-	-	2	mA
Chip Disable to Data Retention Time	T _{CDR}	V _{IN} ≥ V _{DD} - 0.2V	0	-	-	ns
Operation Recovery Time	T _R	or V _{IN} ≤ 0.2V	T _{AVAV}	-	-	ns

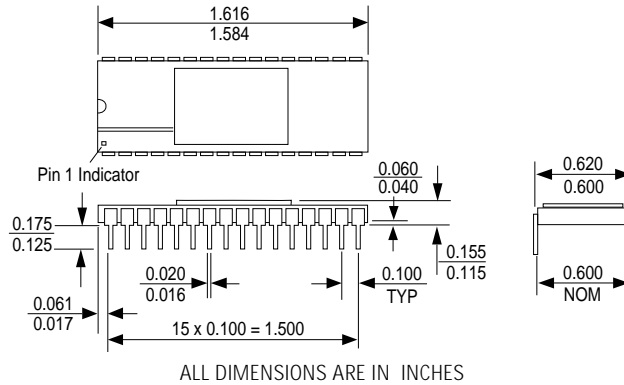
FIG. 5
DATA RETENTION - \overline{CS} CONTROLLED



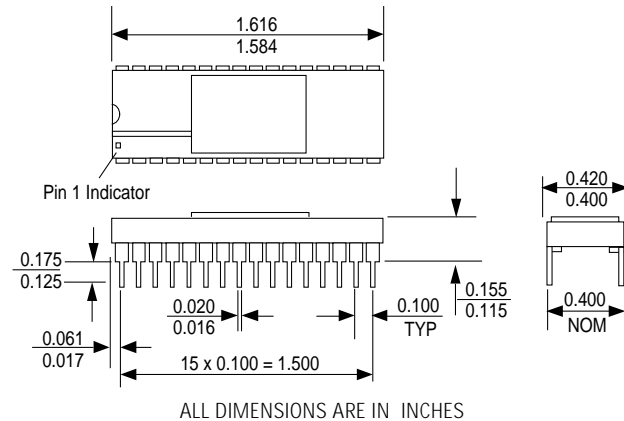
DATA RETENTION, \overline{CS} CONTROLLED



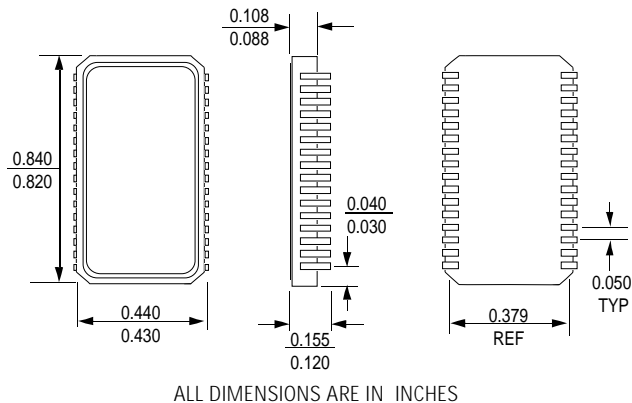
PACKAGE 9: 32 LEAD SIDEBRAZED CERAMIC DIP, SMD 5962-95600XXMXA



PACKAGE 326: 32 LEAD SIDEBRAZED CERAMIC DIP

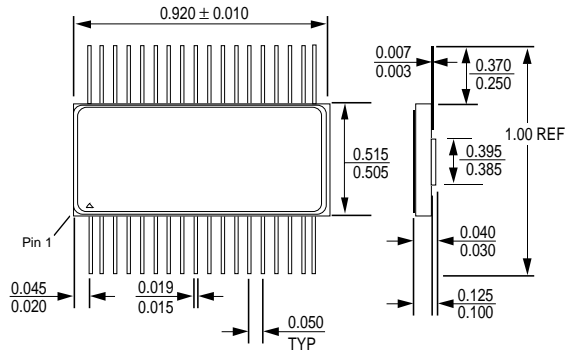


PACKAGE 140: 32 LEAD CERAMIC SOJ, SMD 5962-95600XXMUA



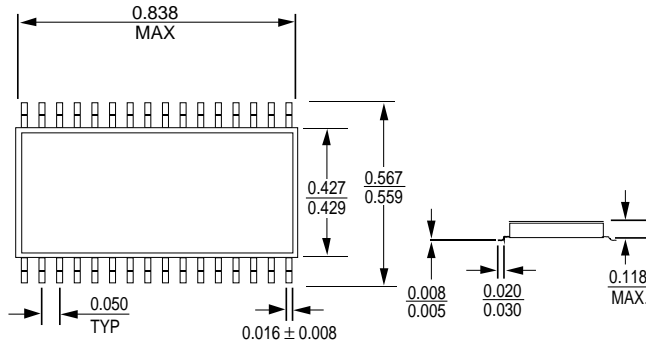


PACKAGE 316: 36 PIN CERAMIC FLATPACK, SMD 5962-95600XXMTA



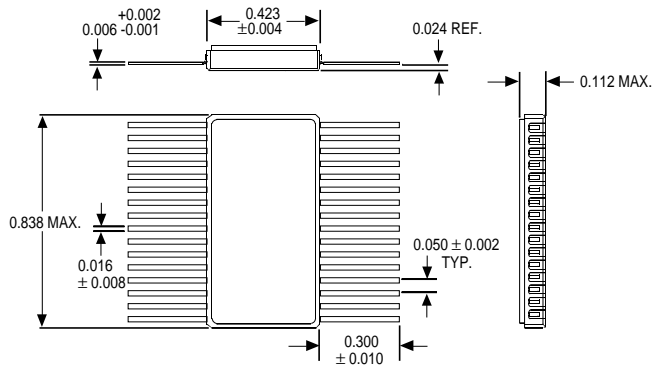
ALL DIMENSIONS ARE IN INCHES

PACKAGE 321: 32 PIN THINPACK™ FLATPACK, SMD 5962-95600XXMYA



ALL DIMENSIONS ARE IN INCHES

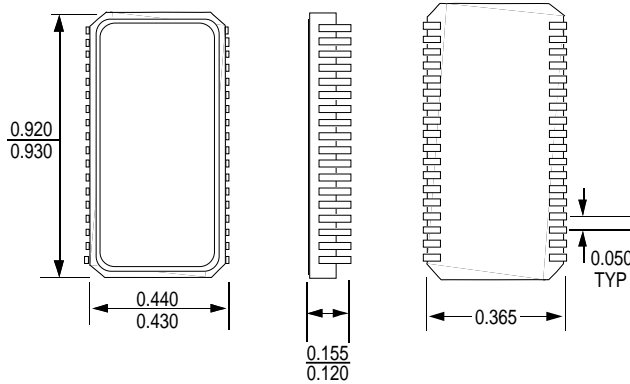
PACKAGE 344: 32 PIN CERAMIC FLATPACK, SMD 5962-95600XXM9A



ALL DIMENSIONS ARE IN INCHES

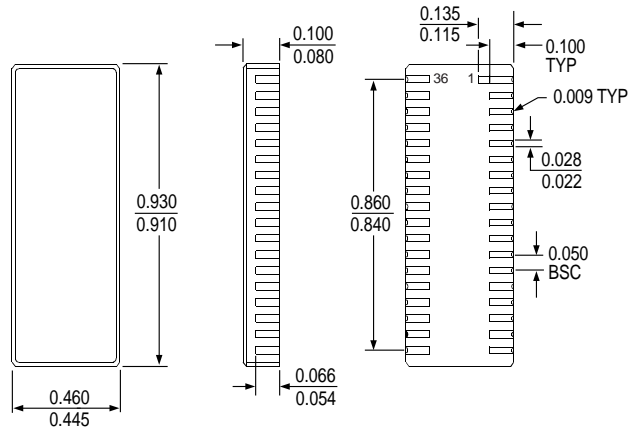


PACKAGE 327: 36 LEAD CERAMIC SOJ, SMD 5962-95600XXMMA



ALL DIMENSIONS ARE IN INCHES

PACKAGE 502: 36 LEAD CERAMIC LCC, SMD 5962-95600XXMNA (Pending)



ALL DIMENSIONS ARE IN INCHES



ORDERING INFORMATION

EDI 8 8 512 CA X X X

WHITE ELECTRONIC DESIGNS

SRAM

ORGANIZATION, 512Kx8

TECHNOLOGY:

CA = CMOS Standard Power

LPA = Low Power

ACCESS TIME (ns)

PACKAGE TYPE:

C = 32 lead Sidebrazed DIP, 600 mil (Package 9)

K = 36 lead Ceramic LCC (Package 502)

N = 32 lead Ceramic SOJ (Package 140)

T = 32 lead Sidebrazed DIP, 400 mil (Package 326)

B32 = 32 pin Ceramic Thinpack™ Flatpack (Package 321)

F32 = 32 pin Ceramic Flatpack (Package 344)

F36 = 36 pin Ceramic Flatpack (Package 316)

N36 = 36 lead Ceramic SOJ (Package 327)

DEVICE GRADE:

B = MIL-STD-883 Compliant

M = Military Screened -55°C to +125°C

I = Industrial -40°C to +85°C

C = Commercial 0°C to +70°C