

**32Kx8 Static RAM  
CMOS, Monolithic**

PRELIMINARY

The EDI8833C/LP/P is a high speed, high performance, low power, 262,144bit CMOS Static RAM organized as 32Kx8.

Inputs and three-state outputs are TTL compatible and allow for direct interfacing with common system bus structures.

Two low power versions are available for military applications, LP and P.

The LP version offers battery back-up data retention capability at VDD equal to 2V and operates from a 5V supply.

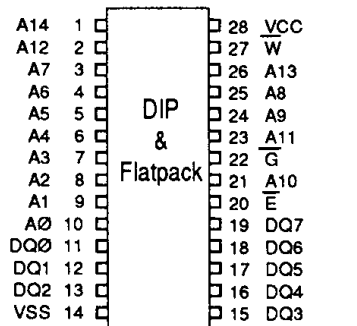
Military product compliant to MIL-STD-883, paragraph 1.2.1 is available.

**Features**

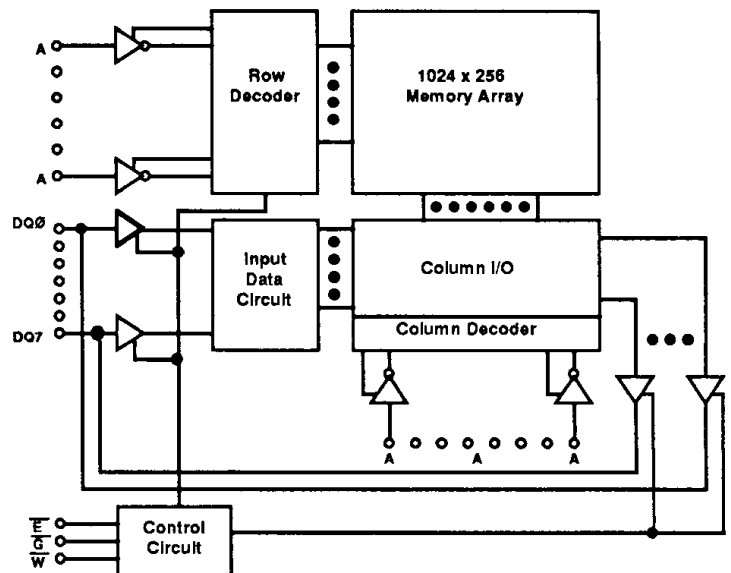
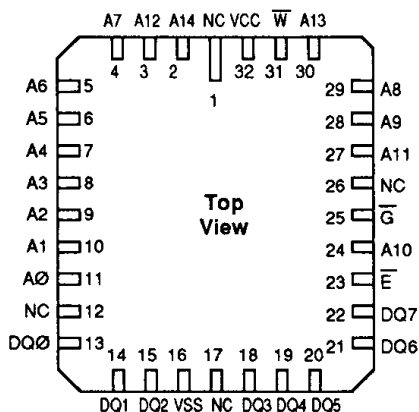
- 32Kx8 bit CMOS Static Random Access Memory, Monolithic
  - Access Times 35, 45, and 55
  - Data Retention Function (LP)
  - TTL Compatible Inputs and Outputs
  - Fully Static, No Clocks
- Jedec Approved Pinouts
  - 28 Pin Sidebraced DIP, 600 mils wide (No. 8)
  - 32 Pad Leadless Chip Carrier (No. 12)
  - 28 Lead Flatpack (No. 79)
- Single +5V ( $\pm 10\%$ ) Supply Operation

**Pin Configuration and Block Diagram**

**Pin Names**



A0-A14	Address Inputs
E	Chip Enable
W	Write Enable
G	Output Enable
DQ0-DQ7	Common Data Input/Output
VCC	Power (+5V $\pm 10\%$ )
VSS	Ground
NC	No Connection



## 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, Ceramic .....	-65°C to +150°C
Power Dissipation .....	1 Watt
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	4.5	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	$\bar{E} = VIL, I/O = 0mA, \text{Min Cycle}$	--		125	mA
Standby (TTL) Power Supply Current	ICC2	$\bar{E} \geq VIH, VIN \leq VIL \text{ or } \geq VIH$	--	--	20	mA
Full Standby Power Supply Current	ICC3	$\bar{E} \geq VCC-0.2V$	C	--	3	mA
		$VIN \geq VCC-0.2V \text{ or } VIN \leq 0.2V$	LP/P	--	900	$\mu A$
Input Leakage Current	ILI	$VIN = 0V \text{ to } VCC$	--	--	$\pm 5$	$\mu A$
Output Leakage Current	ILO	$V I/O = 0V \text{ to } VCC$	--	--	$\pm 10$	$\mu A$
Output High Voltage	VOH	$IOH = -4.0mA$	2.4	--	--	V
Output Low Voltage	VOL	$IOL = 8.0mA$	--	--	0.4	V

\*Typical = TA = 25°C, VCC = 5.0V

## 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
		LCC	FP	DIP	
Input Capacitance (Except DQ Pins)	CI	6	10	10	pF
Capacitance Control (DQ Pins)	CD/Q	8	12	12	pF

These parameters are sampled, not 100% tested.

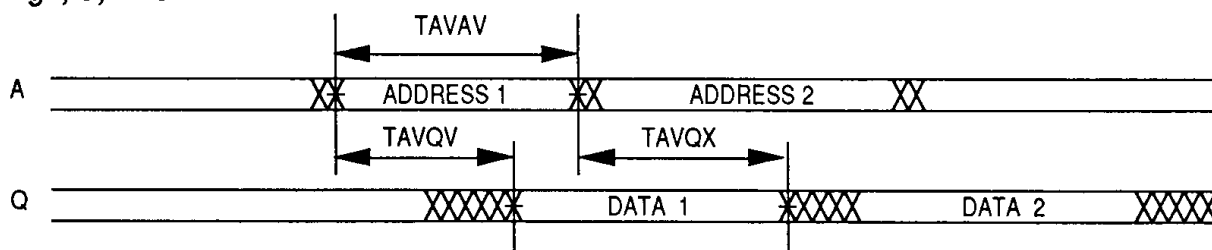
## AC Characteristics

### Read Cycle

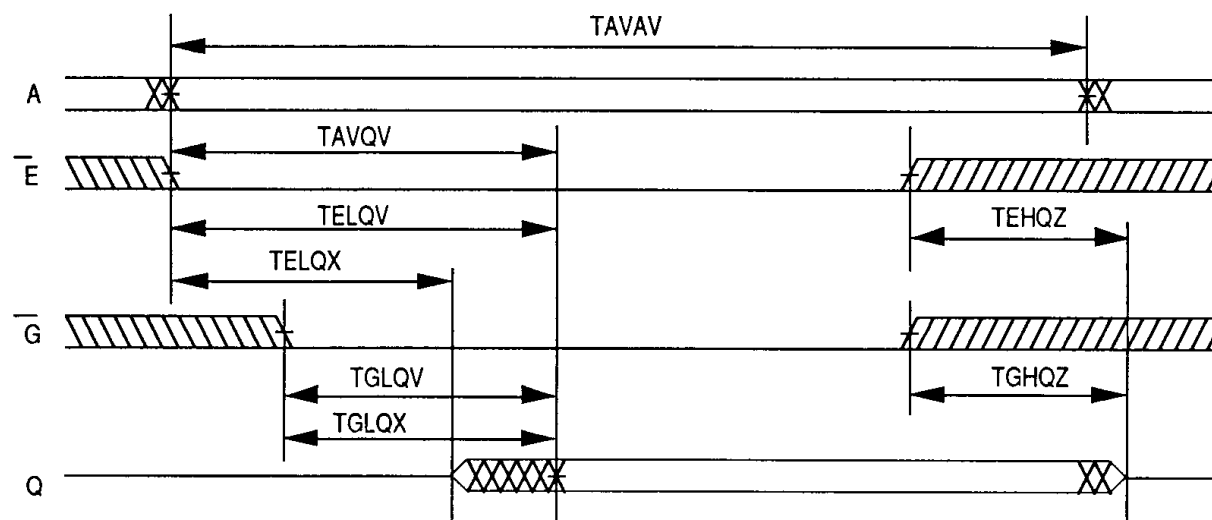
Parameter	Symbol	35ns		45ns		55ns		Units
		Min	Max	Min	Max	Min	Max	
Read Cycle Time	TAVAV	35		45		55		ns
Address Access Time	TAVQV		35		45		55	ns
Chip Enable Access Time	TELQV		35		45		55	ns
Chip Enable to Output Low Z (1)	TELQX	3		3		3		ns
Output Enable to Output Valid	TGLQV		15		20		25	ns
Output Enable to Output in Low Z (1)	TGLQX	3		3		3		ns
Chip Disable to Output in High Z (1)	TEHQZ		15		20		25	ns
Output Disable to Output in High Z (1)	TGHQZ		15		20		25	ns
Output Hold from Address Change	TAVQX	3		3		3		ns

Note 1: Parameter guaranteed, but not tested.

### Read Cycle 1 W High; G, E Low



### Read Cycle 2 W High



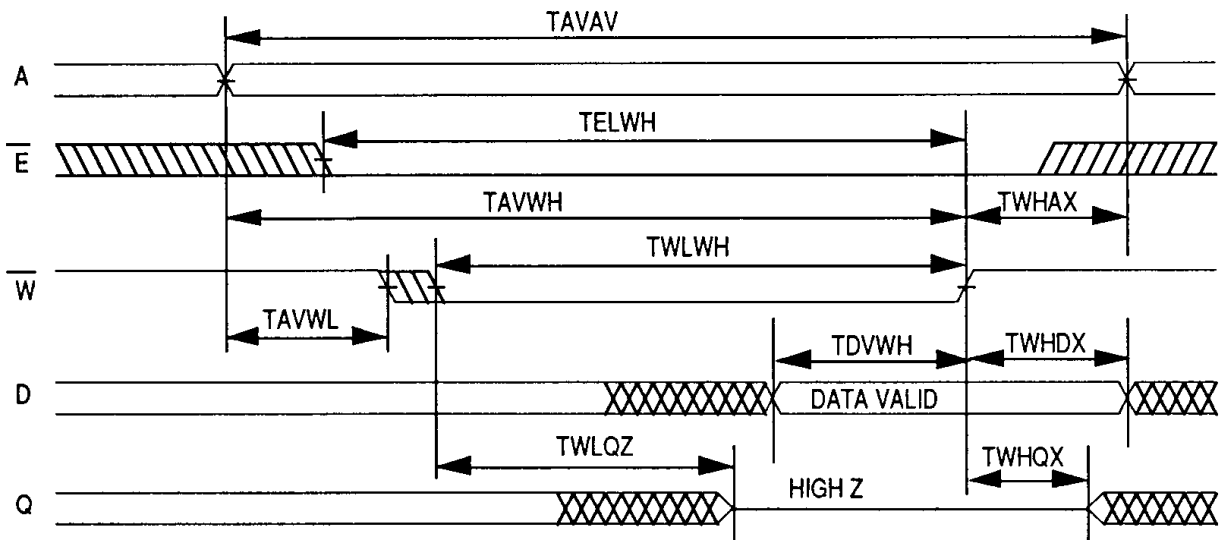
## AC Characteristics

### Write Cycle

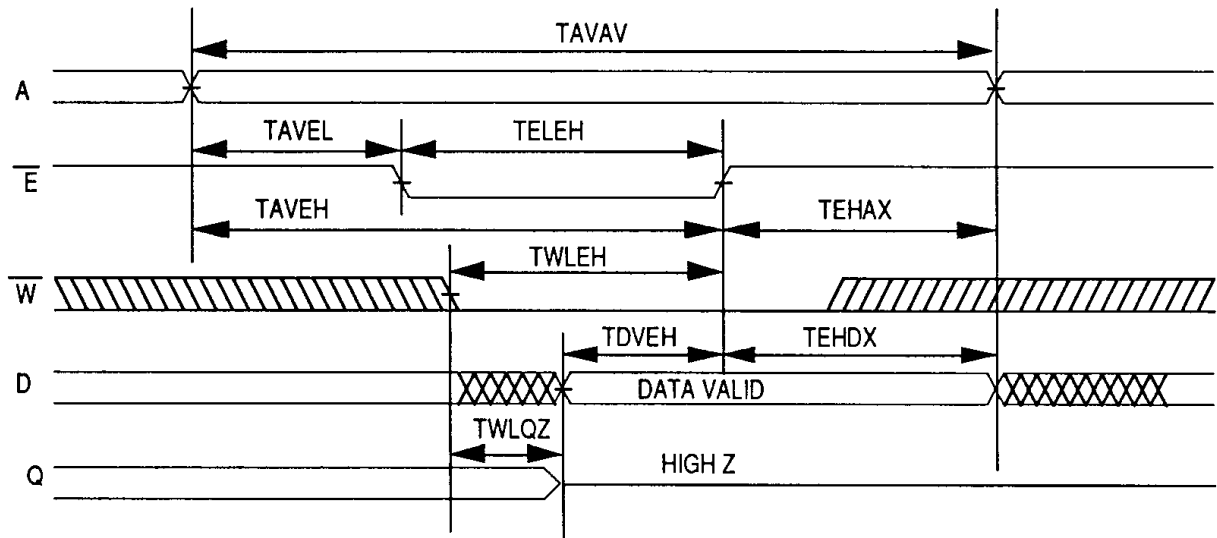
Parameter	Symbol		35ns		45ns		55ns		Units
			Min	Max	Min	Max	Min	Max	
Write Cycle Time	TAVAV		35		45		55		ns
Chip Enable to	TELWH	$\overline{W}$	30		40		50		ns
End of Write	TELEH	$\overline{E}$	30		40		50		ns
Address Setup Time	TAVWL	$\overline{W}$	0		0		0		ns
	TAVEL	$\overline{E}$	0		0		0		ns
Address Valid to	TAVWH	$\overline{W}$	30		40		50		ns
End of Write	TAVEH	$\overline{E}$	30		40		50		ns
Write Pulse Width	TWLWH	$\overline{W}$	25		25		25		ns
	TWLEH	$\overline{E}$	25		25		25		ns
Write Recovery Time	TWHAX	$\overline{W}$	0		0		0		ns
	TEHAX	$\overline{E}$	0		0		0		ns
Data Hold Time	TWHDX	$\overline{W}$	0		0		0		ns
	TEHDX	$\overline{E}$	0		0		0		ns
Write to Output in High Z (1)	TWLQZ			20		20		25	ns
Data to Write Time	TDVWH	$\overline{W}$	15		20		25		ns
	TDVEH	$\overline{E}$	15		20		25		ns
Output Active from End of Write (1)	TWHQX		0		0		0		ns

Note 1: Parameter guaranteed, but not tested.

**Write Cycle 1**  
**W Controlled**



**Write Cycle 2**  
**E Controlled**



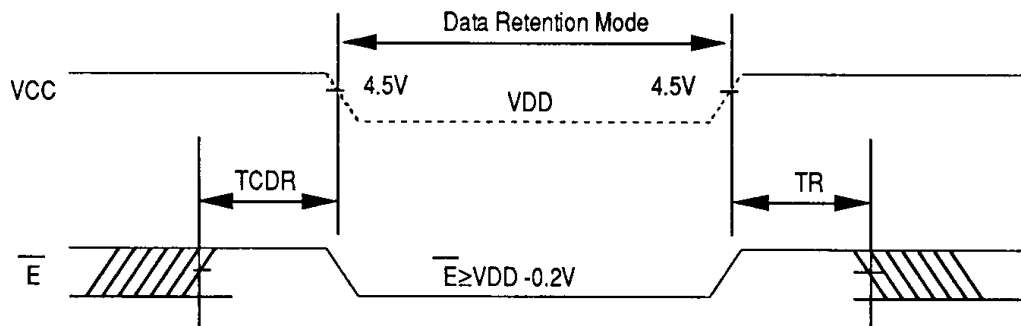
## Data Retention Characteristics

Low Power Version Only, EDI8833LP

Characteristic	Sym	Test Conditions	Min	Typ	Max	Unit
Data Retention Voltage	VDD	VDD = 2.0V	2	--	--	V
Data Retention Quiescent Current	ICCDR	$\bar{E} \geq VDD - 0.2V$			350	$\mu A$
Chip Disable to Data Retention Time	TCDR	VIN $\geq$ VDD - 0.2V	0	--	--	ns
Operation Recovery Time	TR	or VIN $\leq$ 0.2V	TAVAV*	--	--	ns

\*Read Cycle Time

### Data Retention E Controlled



EDI is a leading supplier of hi-rel (military), high-performance CMOS Static RAMs and high density CMOS Static RAM modular subsystems products. These products complement each other to provide high speed CMOS solutions for a wide range of military applications and systems.

The product line includes devices which are fully compliant to the latest revision of MIL-STD-883, paragraph 1.2.1.

EDI is actively involved with the Defense Electronic Supply Center (DESC) in their Standard Military Drawing (SMD) program. The SMD program allows standardization for militarized products and reduction of the proliferation of non-standard source control drawings. Products listed on DESC Drawings at the time of printing this book are listed below. Users should contact either EDI or DESC for current status of products in the SMD program.

**DESC Standard Military Drawing Program**

<b>Description .....</b>	<b>Drawing No. ....</b>	<b>EDI Standard Part No.</b>
8Kx8 .....	5962-38294 .....	EDI8810
8Kx8 .....	5962-85525 .....	EDI8810
8Kx9 .....	5962-89883 .....	EDI8908
32Kx8 .....	5962-88662 .....	EDI8833
32Kx8, Low Power .....	5962-88552 .....	EDI8833
64Kx4 .....	5962-88681 .....	EDI8464/EDI8465
64Kx4, Low Power .....	5962-88545 .....	EDI8464/EDI8465
256Kx1 .....	5962-88725 .....	EDI81256
256Kx1, Low Power .....	5962-88544 .....	EDI81256
128Kx8 .....	5962-89598 .....	EDI88128/EDI88130

<u>Part No.</u>	<u>Type</u>	<u>Density</u>	<u>Org</u>	<u>Page</u>
EDH816H64C	SRAM Module	1Meg	64Kx16 .....	149
EDI20180C	Synchronous SRAM, Latched I/O, 1CLK	1Meg	64Kx18 .....	42
EDI20181C	Synchronous SRAM, Registered I/O, 1CLK	1Meg	64Kx18 .....	42
EDI20182C	Synchronous SRAM, Latched/Asynchronous I/O, 1CLK	1Meg	64Kx18 .....	42
EDI20183C	Synchronous SRAM, Registered/Asynchronous I/O, 1CLK	1Meg	64Kx18 .....	42
EDI20184C	Synchronous SRAM, Latched/Registered I/O, 2CLK	1Meg	64Kx18 .....	42
EDI20185C	Synchronous SRAM, Registered I/O, 2CLK	1Meg	64Kx18 .....	42
EDI2040C	Synchronous SRAM, Latched I/O, 1CLK	1Meg	256Kx4 .....	44
EDI2041C	Synchronous SRAM, Registered I/O, 1CLK	1Meg	256Kx4 .....	44
EDI2042C	Synchronous SRAM, Latched/Asynchronous I/O, 1CLK	1Meg	256Kx4 .....	44
EDI2043C	Synchronous SRAM, Registered/Asynchronous I/O, 1CLK	1Meg	256Kx4 .....	44
EDI2044C	Synchronous SRAM, Latched/Registered I/O, 2CLK	1Meg	256Kx4 .....	44
EDI2045C	Synchronous SRAM, Registered I/O, 2CLK	1Meg	256Kx4 .....	44
EDI2090C	Synchronous SRAM, Latched I/O, 1CLK	1Meg	128Kx9 .....	43
EDI2091C	Synchronous SRAM, Registered I/O, 1CLK	1Meg	128Kx9 .....	43
EDI2092C	Synchronous SRAM, Latched/Asynchronous I/O, 1CLK	1Meg	128Kx9 .....	43
EDI2093C	Synchronous SRAM, Registered/Asynchronous I/O, 1CLK	1Meg	128Kx9 .....	43
EDI2094C	Synchronous SRAM, Latched/Registered I/O, 2CLK	1Meg	128Kx9 .....	43
EDI2095C	Synchronous SRAM, Registered I/O, 2CLK	1Meg	128Kx9 .....	43
EDI28160C	Synchronous SRAM	256K	16Kx16 .....	25
EDI28165C	Asynchronous/Latched Address SRAM	256K	16Kx16 .....	25
EDI2840C	Synchronous SRAM	256K	64Kx4 .....	38
EDI2841C	Synchronous SRAM, with Parity	256K	64Kx4 .....	38
EDI2842C	Synchronous SRAM, with Output Registers	256K	64Kx4 .....	38
EDI2843C	Synchronous SRAM, with Output Registers and Parity	256K	64Kx4 .....	38
EDI411024C	DRAM	1Meg	1Mx1 .....	291
EDI414096C	DRAM	4Meg	4Kx1 .....	305
EDI441024C	DRAM	4Meg	1Mx4 .....	304
EDI44256C	DRAM	1Meg	256Kx4 .....	275
EDI811024CS	Monolithic SRAM, Standard Power	1Meg	1Mx1 .....	137
EDI81256C	Monolithic SRAM, Standard Power	256K	256Kx1 .....	98
EDI81256CA	Monolithic SRAM, Standard Power	256K	256Kx1 .....	104
EDI81256LP	Monolithic SRAM, Low Power, with IDR	256K	256Kx1 .....	98
EDI81256LPA	Monolithic SRAM, Low Power, with IDR	256K	256Kx1 .....	104
EDI81256P	Monolithic SRAM, Low Power	256K	256Kx1 .....	98
EDI81256PA	Monolithic SRAM, Low Power	256K	256Kx1 .....	104
EDI81257CA	Monolithic SRAM	256K	256Kx1 .....	110
EDI81257CB	Monolithic SRAM	256K	256Kx1 .....	115
EDI84256CS	Monolithic SRAM, Standard Power	1Meg	256Kx4 .....	130
EDI84256LPS	Monolithic SRAM, Low Power, with IDR	1Meg	256Kx4 .....	130
EDI84256PS	Monolithic SRAM, Low Power	1Meg	256Kx4 .....	130
EDI84258CS	Monolithic SRAM, Standard Power	1Meg	256Kx4 .....	136
EDI84258LPS	Monolithic SRAM, Low Power, with IDR	1Meg	256Kx4 .....	136
EDI84258PS	Monolithic SRAM, Low Power	1Meg	256Kx4 .....	136
EDI8464C	Monolithic SRAM, Standard Power	256K	64Kx4 .....	78
EDI8464LP	Monolithic SRAM, Low Power, with IDR	256K	64Kx4 .....	78
EDI8464P	Monolithic SRAM, Low Power	256K	64Kx4 .....	78
EDI8465C	Monolithic SRAM, Standard Power	256K	64Kx4 .....	84
EDI8465CA	Monolithic SRAM	256K	64Kx4 .....	90
EDI8465CB	Monolithic SRAM	256K	64Kx4 .....	95



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EDI8465LP	Monolithic SRAM, Low Power, with IDR	256K	64Kx4 .....	84
EDI8465P	Monolithic SRAM, Low Power	256K	64Kx4 .....	84
EDI8466CA	Monolithic SRAM	256K	64Kx4 .....	96
EDI8466CB	Monolithic SRAM	256K	64Kx4 .....	97
EDI8808CB	Monolithic SRAM	64K	8Kx8 .....	47
EDI8810H	Monolithic SRAM, 6T CMOS	64K	8Kx8 .....	48
EDI8810L	Monolithic SRAM, 6T CMOS, Low Power	64K	8Kx8 .....	48
EDI88128C	Monolithic SRAM, Standard Power	1Meg	128Kx8 .....	116
EDI88128LP	Monolithic SRAM, Low Power, with IDR	1Meg	128Kx8 .....	116
EDI88128P	Monolithic SRAM, Low Power	1Meg	128Kx8 .....	116
EDI88130CS	Monolithic SRAM, Standard Power	1Meg	128Kx8 .....	124
EDI88130LPS	Monolithic SRAM, Low Power, with IDR	1Meg	128Kx8 .....	124
EDI88130PS	Monolithic SRAM, Low Power	1Meg	128Kx8 .....	124
EDI8832C	Monolithic SRAM, Standard Power	256K	32Kx8 .....	60
EDI8832LP	Monolithic SRAM, Low Power, with IDR	256K	32Kx8 .....	60
EDI8832P	Monolithic SRAM, Low Power	256K	32Kx8 .....	60
EDI8833C	Monolithic SRAM, Standard Power	256K	32Kx8 .....	66
EDI8833LP	Monolithic SRAM, Low Power, with IDR	256K	32Kx8 .....	66
EDI8833P	Monolithic SRAM, Low Power	256K	32Kx8 .....	66
EDI8834C	Monolithic SRAM	256K	32Kx8 .....	72
EDI8834CA	Monolithic SRAM	256K	32Kx8 .....	77
EDI8908CA	Monolithic SRAM	72K	8Kx9 .....	54
EDI8908LPA	Monolithic SRAM, Low Power, with IDR	72K	8Kx9 .....	54
EDI8908PA	Monolithic SRAM, Low Power	72K	8Kx9 .....	54
EDI8F16257C	SRAM Module	4Meg	256Kx16 .....	235
EDI8F1664C	SRAM Module	1Meg	64Kx16 .....	155
EDI8F1664CA	SRAM Module	1Meg	64Kx16 .....	160
EDI8F32256C	SRAM Module, Standard Power	8Meg	256Kx32 .....	262
EDI8F3264C	SRAM Module, Standard Power	2Meg	64Kx32 .....	201
EDI8F4258C	SRAM Module	1Meg	256Kx4 .....	184
EDI8F81024C	SRAM Module	8Meg	1Megx8 .....	270
EDI8F8128C	SRAM Module	1Meg	128Kx8 .....	169
EDI8F8257C	SRAM Module, Standard Power	2Meg	256Kx8 .....	209
EDI8F8257LP	SRAM Module, Low Power with IDR	2Meg	256Kx8 .....	209
EDI8F8257P	SRAM Module, Low Power	2Meg	256Kx8 .....	209
EDI8F8258C	SRAM Module	2Meg	256Kx8 .....	215
EDI8F8259C	SRAM Module	2Meg	256Kx8 .....	216
EDI8F8512C	SRAM Module, Standard Power	4Meg	512Kx8 .....	243
EDI8F8512LP	SRAM Module, Low Power with IDR	4Meg	512Kx8 .....	243
EDI8F8512P	SRAM Module, Low Power	4Meg	512Kx8 .....	243
EDI8F8513C	SRAM Module	4Meg	512Kx8 .....	249
EDI8M11024C	SRAM Module	1Meg	1Megx1 .....	196
EDI8M16256C	SRAM Module	4Meg	256Kx16 .....	236
EDI8M16257C	SRAM Module	4Meg	256Kx16 .....	242
EDI8M1664C	SRAM Module, Standard Power	1Meg	64Kx16 .....	161
EDI8M1664LP	SRAM Module, Low Power with IDR	1Meg	64Kx16 .....	161
EDI8M1664P	SRAM Module, Low Power	1Meg	64Kx16 .....	161
EDI8M32256C	SRAM Module	8Meg	256Kx32 .....	262
EDI8M3264C	SRAM Module	2Meg	64Kx32 .....	208
EDI8M4257C	SRAM Module, Standard Power	1Meg	256Kx4 .....	191

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EDI8M8128C	SRAM Module, Standard Power	1Meg	128Kx8 .....	176
EDI8M8128LP	SRAM Module, Low Power with IDR	1Meg	128Kx8 .....	176
EDI8M8128P	SRAM Module, Low Power	1Meg	128Kx8 .....	176
EDI8M8256C	SRAM Module, Standard Power	2Meg	256Kx8 .....	221
EDI8M8256LP	SRAM Module, Low Power with IDR	2Meg	256Kx8 .....	221
EDI8M8256P	SRAM Module, Low Power	2Meg	256Kx8 .....	221
EDI8M8257C	SRAM Module, Standard Power	2Meg	256Kx8 .....	227
EDI8M8257LP	SRAM Module, Low Power with IDR	2Meg	256Kx8 .....	227
EDI8M8257P	SRAM Module, Low Power	2Meg	256Kx8 .....	227
EDI8M8512C	SRAM Module, Standard Power	4Meg	512Kx8 .....	254
EDI8M8512LP	SRAM Module, Low Power with IDR	4Meg	512Kx8 .....	254
EDI8M8512P	SRAM Module, Low Power	4Meg	512Kx8 .....	254
EDI8M864C	SRAM Module	512K	64Kx8 .....	141

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### Static RAMs, Monolithic & Module

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64K	8Kx8	EDI8808CB .....	47
64K	8Kx8	EDI8810HL .....	48
72K	8Kx9	EDI8908CA/LPA/PA .....	54
256K	32Kx8	EDI8832C/LP/P .....	60
256K	32Kx8	EDI8833C/LP/P .....	66
256K	32Kx8	EDI8834C .....	72
256K	32Kx8	EDI8834CA .....	77
256K	64Kx4	EDI8464C/LP/P .....	78
256K	64Kx4	EDI8465C/LP/P .....	84
256K	64Kx4	EDI8465CA .....	90
256K	64Kx4	EDI8465CB .....	95
256K	64Kx4	EDI8466CA .....	96
256K	64Kx4	EDI8466CB .....	97
256K	256Kx1	EDI81256C/LP/P .....	98
256K	256Kx1	EDI81256CA/LPA/PA .....	104
256K	256Kx1	EDI81257CA .....	110
256K	256Kx1	EDI81257CB .....	115
512K	64Kx8	EDI8M864C .....	116
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1Meg	64Kx16	EDI8M1664C/LP/P .....	161
1Meg	128Kx8	EDI88128C/LP/P .....	116
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### Static RAMs, Monolithic & Module, cont'd

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1Meg	128Kx8	EDI8M8128C/LP/P .....	176
1Meg	128Kx8	EDI88130CS/LPS/PS .....	124
1Meg	256Kx4	EDI84256CS/LPS/PS .....	130
1Meg	256Kx4	EDI84258CS/LPS/PS .....	136
1Meg	256Kx4	EDI8F4258C .....	184
1Meg	256Kx4	EDI8M4257C .....	191
1Meg	1Mx1	EDI811024CS .....	137
1Meg	1Megx1	EDI8M11024C .....	196
2Meg	256Kx8	EDI8F8257C/LP/P .....	209
2Meg	256Kx8	EDI8F8258C .....	215
2Meg	256Kx8	EDI8F8259C .....	216
2Meg	256Kx8	EDI8M8256C/LP/P .....	221
2Meg	256Kx8	EDI8M8257C/LP/P .....	227
2Meg	64Kx32	EDI8F3264C .....	201
2Meg	64Kx32	EDI8M3264C .....	208
4Meg	256Kx16	EDI8F16257C .....	235
4Meg	256Kx16	EDI8M16256C .....	236
4Meg	256Kx16	EDI8M16257C .....	242
4Meg	512Kx8	EDI8F8512C/LP/P .....	243
4Meg	512Kx8	EDI8F8513C .....	249
4Meg	512Kx8	EDI8M8512C/LP/P .....	254
8Meg	256Kx32	EDI8F32256C .....	262
8Meg	256Kx32	EDI8M32256C .....	269
8Meg	1Megx8	EDI8F81024C .....	270

### Dynamic RAMs

<u>Density</u>	<u>Org.</u>	<u>Part No.</u>	<u>Page</u>
1Meg	256Kx4	EDI44256C .....	275
1Meg	1Mx1	EDI411024C .....	291
4Meg	1Mx4	EDI441024C .....	304
4Meg	4Kx1	EDI414096C .....	305