

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

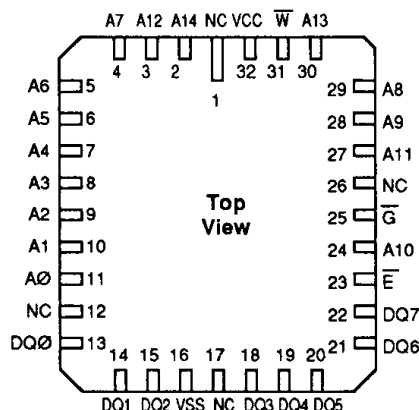
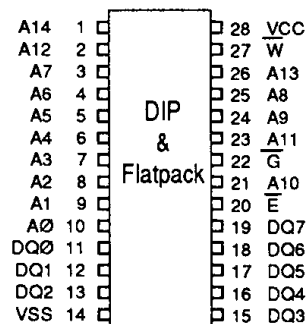
Jedec Approved Pinouts

- 28 Pin Sidebraced DIP, 600 mils wide (No. 8)
- 32 Pad Leadless Chip Carrier (No. 12)
- 28 Lead Flatpack (No. 79)

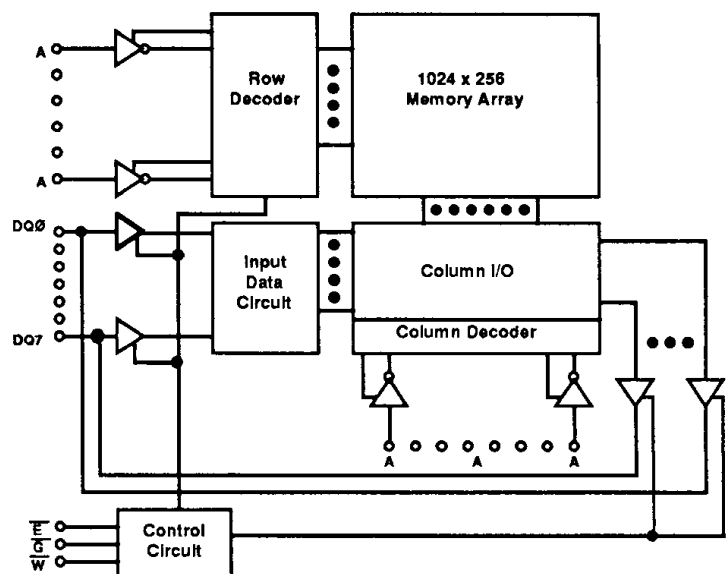
Single +5V ($\pm 10\%$) Supply Operation

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	μA
Input Leakage Current	ILI	$VIN = 0V \text{ to } VCC$	--	--	± 5	μA
Output Leakage Current	ILO	$V I/O = 0V \text{ to } VCC$	--	--	± 10	μA
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

G	E	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

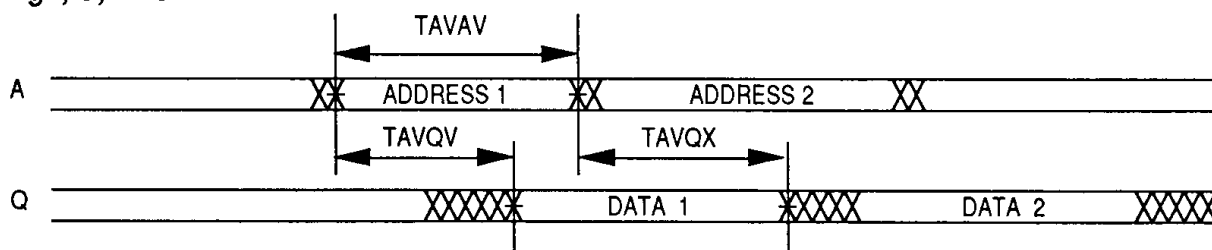
Read Cycle

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.

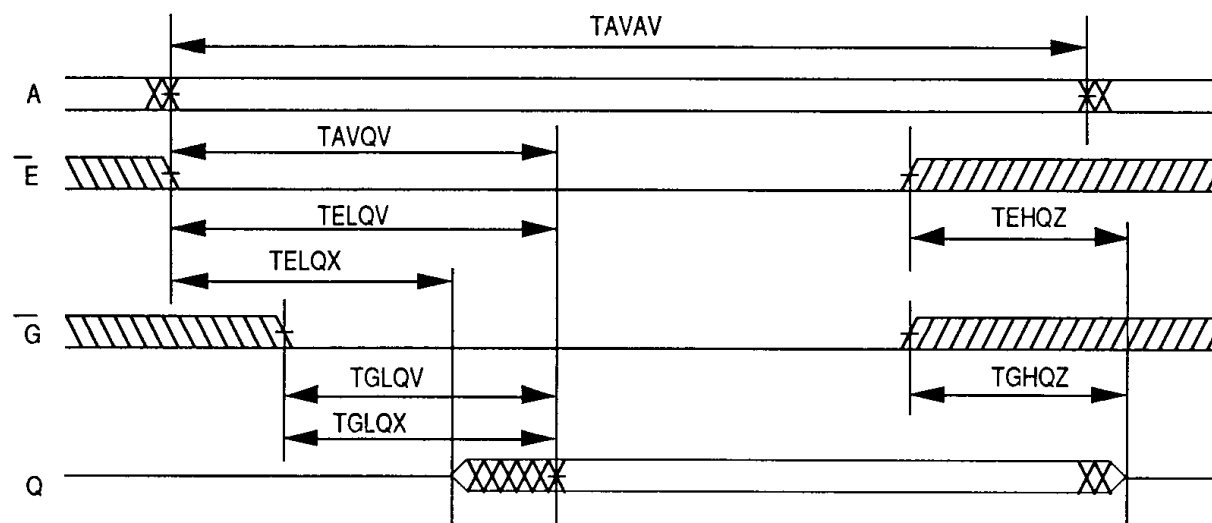
Read Cycle 1

W High; G, E Low



Read Cycle 2

W High

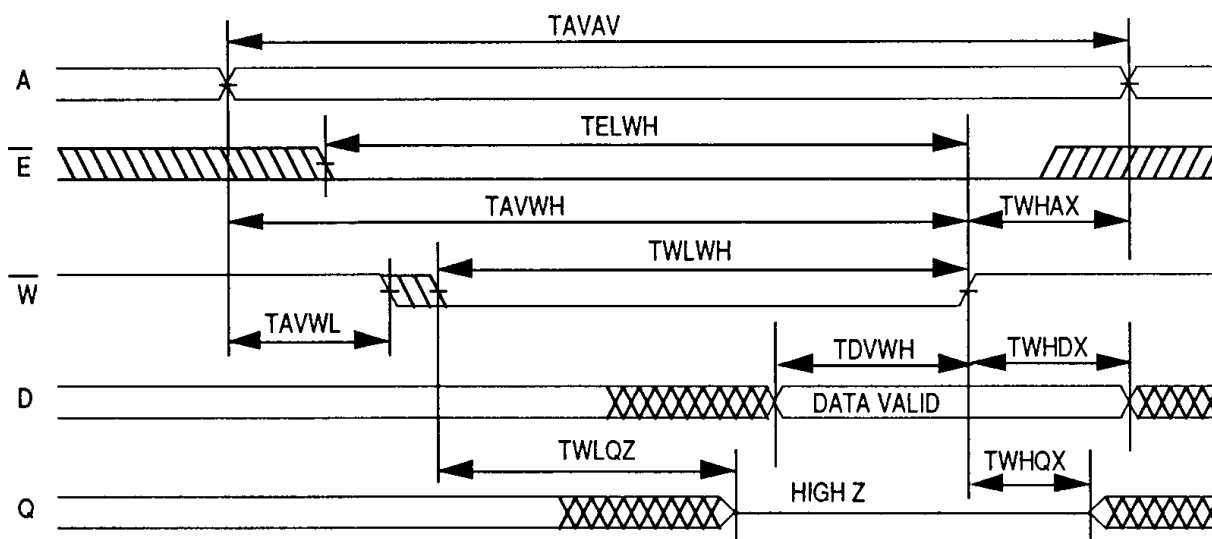


AC Characteristics **Write Cycle**

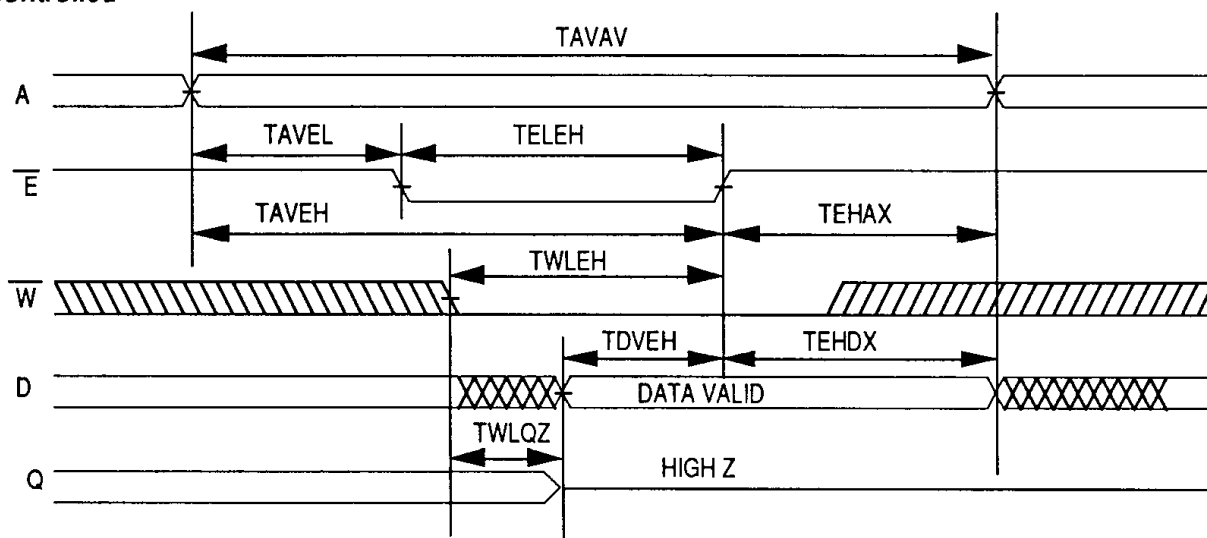
Parameter	Symbol		35ns		45ns		55ns		Units
			Min	Max	Min	Max	Min	Max	
Write Cycle Time	TAVAV		35		45		55		ns
Chip Enable to	TELWH	$\overline{W}$	30		40		50		ns
End of Write	TELEH	$\overline{E}$	30		40		50		ns
Address Setup Time	TAVWL	$\overline{W}$	0		0		0		ns
	TAVEL	$\overline{E}$	0		0		0		ns
Address Valid to	TAVWH	$\overline{W}$	30		40		50		ns
	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
 $\overline{W}$ Controlled



Write Cycle 2
 $\overline{E}$ Controlled



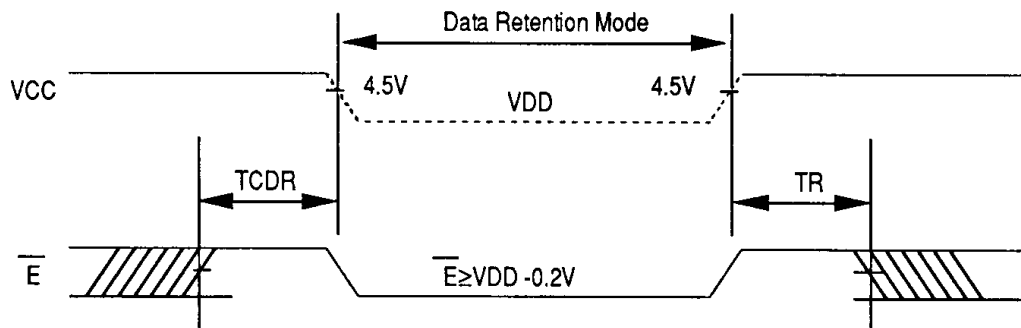
Data Retention Characteristics

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	$\overline{E} \geq VDD - 0.2V$			350	μA
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

<i>Description</i>	<i>Drawing No.</i>	<i>EDI Standard Part No.</i>
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

<u>Part No.</u>	<u>Type</u>	<u>Density</u>	<u>Org</u>	<u>Page</u>
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

<u>Part No.</u>	<u>Type</u>	<u>Density</u>	<u>Org</u>	<u>Page</u>
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

Index by Density

SRAMs, Synchronous

<u>Density</u>	<u>Org.</u>	<u>Part No.</u>	<u>Page</u>
256K	16Kx16	EDI2816XC	25
256K	64Kx4	EDI284XC	38
1Meg	64Kx18	EDI2018XC	42
1Meg	128Kx9	EDI209XC	43
1Meg	256Kx4	EDI204XC	44

Static RAMs, Monolithic & Module

<u>Density</u>	<u>Org.</u>	<u>Part No.</u>	<u>Page</u>
64K	8Kx8	EDI8808CB	47
64K	8Kx8	EDI8810H/L	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
1Meg	64Kx16	EDH816H64C	149
1Meg	64Kx16	EDI8F1664C	155
1Meg	64Kx16	EDI8F1664CA	160
1Meg	64Kx16	EDI8M1664C/LP/P	161
1Meg	128Kx8	EDI88128C/LP/P	116
1Meg	128Kx8	EDI8F8128C	169

Static RAMs, Monolithic & Module, cont'd

<u>Density</u>	<u>Org.</u>	<u>Part No.</u>	<u>Page</u>
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