

May 1990

PRODUCT PROFILE

# MB85414-30/-40

## CMOS STATIC RAM MODULE

### 16384 Words x 32-Bit

The Fujitsu MB85414 is a fully decoded, CMOS static random access memory module (SRAM) with eight MB81C75 devices mounted on a 64-pin Epoxy module. These modules incorporate a presence detect feature that permits system level memory density verification for those applications with multiple modules. Organized as eight 16K x 4 common I/O devices, the MB85414 is optimized for memory applications where low power, high performance, large memory storage, and high density are required.

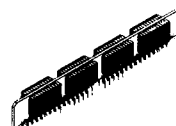
- Organized as 16384 x 32-Bit Words
- Access Time/Cycle Time  
-30: 30 ns  
-40: 40 ns
- Low Power Dissipation  
Active: 3520 mW (Max)  
Standby: 440 mW  
CMOS Level  
880 mW  
TTL Level
- Static Operation
- Single +5 V  $\pm$ 10% Power Supply
- Four Select Pins (x8, x16, x32)
- Presence Detect: PD0 = GND;  
PD1 = Open
- Common Data Inputs and Outputs
- 64-pin Epoxy Module (ZIP)
- Input/Output Pins TTL Compatible
- Temperature Range: 0°C to 70°C

### ABSOLUTE MAXIMUM RATINGS (See NOTE)

Rating	Symbol	Value	Rating
Supply Voltage	V <sub>CC</sub>	-0.5 to +7.0	V
Input Voltage	V <sub>IN</sub>	-3.5 to +7.0	V
Output Voltage	V <sub>OUT</sub>	-0.5 to +7.0	V
Short Circuit Output Current	I <sub>OUT</sub>	$\pm$ 50	mA
Power Dissipation	P <sub>D</sub>	8.0	W
Temperature under Bias	T <sub>BIAS</sub>	-10 to +85	°C
Storage Temperature	T <sub>STG</sub>	-45 to +125	°C

**NOTE:** Permanent device damage may occur if absolute maximum ratings are exceeded. Functional operation should be restricted to the conditions as detailed in the operational section of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

### PRELIMINARY



PLASTIC PACKAGE  
MZP-64P-P01

### PIN ASSIGNMENT

PD0 2	1 VSS
DQ0 4	3 PD1
DQ1 6	5 DQ4
DQ2 8	7 DQ5
DQ3 10	9 DQ6
VCC 12	11 DQ7
A6 14	13 A7
A10 16	15 A5
A3 18	17 A11
DQ8 20	19 DQ12
DQ9 22	21 DQ13
DQ10 24	23 DQ14
DQ11 26	25 DQ15
W 28	27 VSS
NC 30	29 NC
CS1 32	31 CS2
CS3 34	33 CS4
NC 36	35 NC
VSS 38	37 OE
DQ16 40	39 DQ20
DQ17 42	41 DQ21
DQ18 44	43 DQ22
DQ19 44	45 DQ23
A1 48	47 A2
A9 50	49 A4
A0 52	51 A13
A12 54	53 VCC
DQ24 56	55 A8
DQ25 58	57 DQ28
DQ26 60	59 DQ29
DQ27 62	61 DQ30
VSS 64	63 DQ31

This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

DataSheet

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## MB85414-30/-40

### CAPACITANCE ( $T_A = 25^\circ\text{C}$ , $f = 1\text{MHz}$ )

PARAMETER	SYMBOL	VALUE		UNIT
		Typ	Max	
Input Capacitance, Address, WE and OE	$C_{IN1}$		90	pF
Input Capacitance, $\overline{CS}_{1-4}$	$C_{IN2}$		30	pF
Output Capacitance, $DQ_{0-31}$	$C_{VO}$		12	pF

### DC CHARACTERISTICS

(At recommended operating conditions unless otherwise noted)

PARAMETER	SYMBOL	VALUE			UNIT
		Min	Typ	Max	
Input Leakage Current ( $V_{IN} = 0\text{V to } V_{CC}$ )	$I_{LI}$	-80		80	$\mu\text{A}$
Output Leakage Current ( $CS = V_{IH}$ , $V_{OUT} = 0\text{V to } V_{CC}$ )	$I_{LO}$	-10		10	$\mu\text{A}$
Standby Power Supply Current	CMOS level			80	mA
	TTL level			160	mA
Active Power Supply Current ( $CS = V_{IL}$ , $I_{OUT} = 0\text{ mA}$ )	$I_{CC1}$			480	mA
Operating Supply Current (Cycle = Min., $I_{OUT} = 0\text{ mA}$ )	$I_{CC2}$			640	mA
Input High Level	$V_{IH}$	2.2		6.0	V
Input Low Level <sup>1</sup>	$V_{IL}$	-0.5		0.8	V
Output High Level ( $I_{OH} = -4\text{ mA}$ )	$V_{OH}$	2.4			V
Output Low Level ( $I_{OL} = 16\text{ mA}$ )	$V_{OL}$			0.4	V

Note: <sup>1</sup>-2.0V level with a maximum pulse width of 20 ns.

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## AC CHARACTERISTICS

(At recommended operating conditions unless otherwise noted)\*

### READ CYCLE

PARAMETER	SYM	MB85414-30		MB85414-40		UNIT	NOTE
		Min	Max	Min	Max		
Read Cycle Time	$t_{RC}$	30		40		ns	1
Address Access Time	$t_{AA}$		30		40	ns	
CS Access Time	$t_{ACS}$		30		40	ns	2
OE Access Time	$t_{OE}$		15		20	ns	2
Output Hold from Address Change	$t_{OH}$	5		5		ns	
Output Hold from Output Disable	$t_{OHC}$	3		3		ns	
CS to Output Low-Z	$t_{CLZ}$	5		5		ns	3,4
OE to Output Low-Z	$t_{OLZ}$	0		0		ns	3,4
CS to Output High-Z	$t_{CHZ}$		10		15	ns	3,4
OE to Output High-Z	$t_{OHZ}$		10		15	ns	3,4
Power Up from CS	$t_{PU}$	0		0		ns	
Power Down from CS	$t_{PD}$		20		30	ns	

DataSheet

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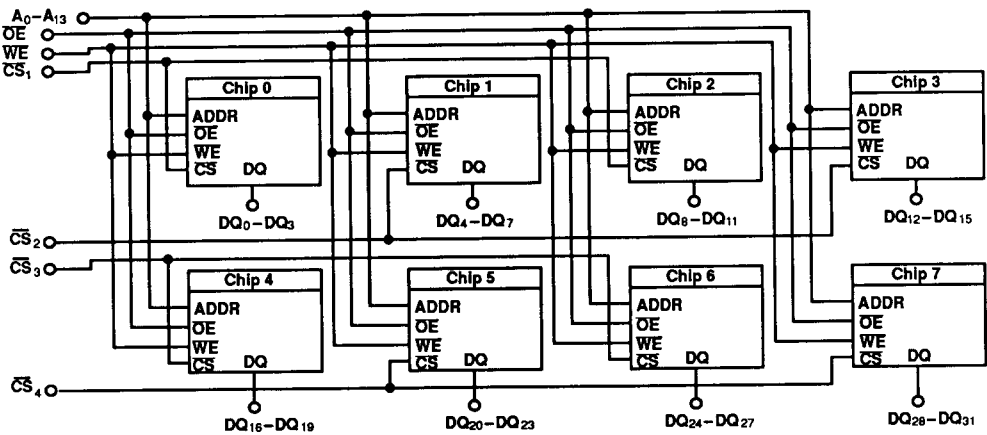
### WRITE CYCLE

PARAMETER	SYM	MB85414-30		MB85414-40		UNIT	NOTE
		Min	Max	Min	Max		
Write Cycle Time	$t_{WC}$	30		40		ns	2
Address Valid to End of Write	$t_{AW}$	25		35		ns	
CS to End of Write	$t_{CW}$	25		35		ns	
Data Hold Time	$t_{DH}$	2		2		ns	
Write Pulse Width	$t_{WP}$	20		30		ns	
Data Valid to End of Write	$t_{DW}$	15		20		ns	
Address Setup Time	$t_{AS}$	0		0		ns	
Write Recovery Time	$t_{WR}$	2		2		ns	
Output High-Z from WE	$t_{WHZ}$		10		15	ns	3,4
Output Low-Z from WE	$t_{LWZ}$	0	20	0	20	ns	3,4

Notes: \* Refer to MB81C75 data sheet electricals for an explanation of the notes.

## MB85414-30/-40

## FUNCTIONAL BLOCK DIAGRAM



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## PACKAGE DIMENSIONS

64-Lead Epoxy Module  
(Case No.: MZP-64P-P01)