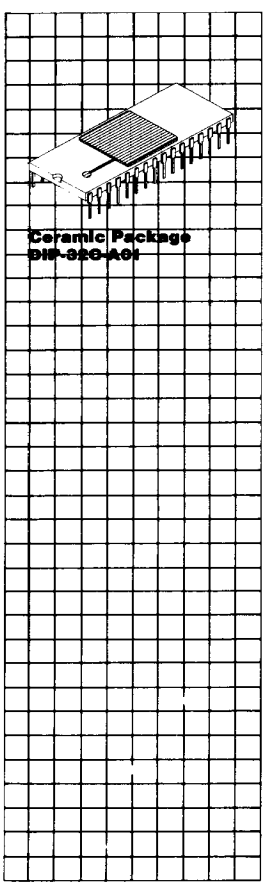
MB70801-15
4,608-Bit Bipolar Random Access Memory

Description

The Fujitsu MB70801-15 is a fully decoded 4608-bit ECL read/write random access memory designed for high-speed scratch pad, control and buffer storage applications. This device is organized as 512 words by 9-bits, and it features on-chip voltage compensation for improved noise margin.

The MB70801-15 offers extremely small cell and chip size, realized through the use of Fujitsu's patented DOPOS (Doped Polysilicon), as well as IOP-II (Isolation by Oxide and Polysilicon), processing. As a result, very fast access time with high yields and outstanding device reliability are achieved in volume production.

Operation for the MB70801-15 is specified over a temperature range of 0° to 75°C (ambient). It also features metal-sealed 32-pin dual-in-line packaging, and it is fully compatible with industry-standard 10K-series ECL families.



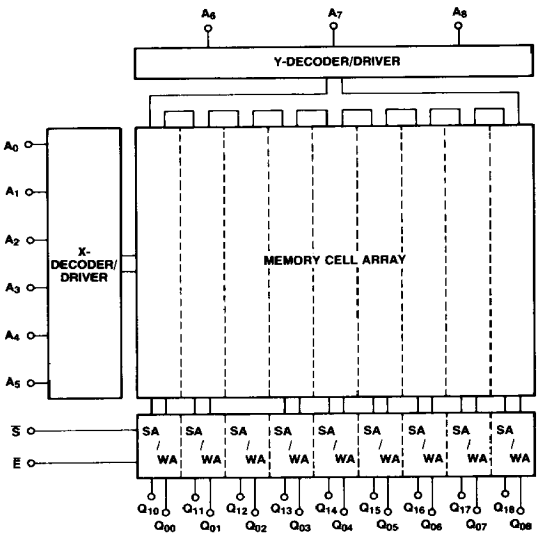
Ceramic Package
DIP-32C-A01

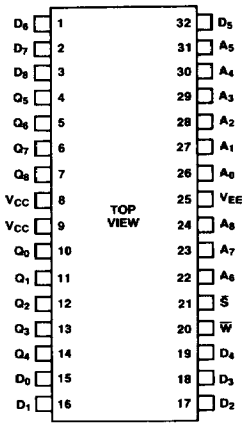
Features

- **512 words x 9-bits organization**
- **On-chip voltage compensation for improved noise margin**
- **Fully compatible with industry-standard 10K-series ECL families**
- **Address access time: 15 ns max. 12 ns typ.**
- **Chip select access time: 10 ns max. 6 ns typ.**
- **Open emitter output for ease of memory expansion**
- **Low power dissipation of 0.25 mW/bit typ.**
- **DOPOS and IOP-II processing**

Small geometry bipolar integrated circuits are occasionally susceptible to damage from static voltages or electric fields. It is therefore advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this device.

MB70801-15 Block Diagram and Pin Assignment





TRUTH TABLE

INPUT			OUTPUT (Q)	MODE
$\overline{S}$	$\overline{W}$	IN		
H	X	X	L	DISABLE
L	L	H	L	WRITE "H"
L	L	L	L	WRITE "L"
L	H	X	OUT	READ

H = HIGH VOLTAGE LEVEL
L = LOW VOLTAGE LEVEL
X = DON'T CARE

Absolute Maximum Ratings (See Note)

Rating	Symbol	Value	Unit
V_{EE} pin potential to ground pin	V_{EE}	+0.5 to −7.0	V
Input voltage	V_{IN}	+0.5 to V_{EE}	V
Output current (DC, output high)	I_{OUT}	−30	mA
Temperature under bias	T_A	−55 to +125	°C
Storage temperature	T_{STG}	−65 to +150	°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 sections of this data sheet.

Functional Description

The Fujitsu MB70801-15 is a fully decoded 4,608 bit read/write random access memory organized as 512 words by 9 bits. Memory cell selection is achieved by means of a 9-bit address designated A_0 through A_8. The active low Chip Select ($\overline{S}$) input is provied for memory expansion. The read and write operations are controlled by the state of the active low Write Enable ($\overline{W}$) input. With $\overline{W}$ and $\overline{S}$ held low, the data at IN is written into the address location. To read, $\overline{W}$ is held high, while $\overline{S}$ is held low. Data at the addressed location is then transferred to OUT and read out non-inverted. Open emitter outputs are provided to allow for maximum flexibility in output wired-OR connection.

Guaranteed Operating Conditions

(Referenced to V_{CC})

Parameter	Symbol	Min	Typ	Max	Unit	T_A
Supply voltage	V_{EE}	−5.46	−5.2	−4.94	V	0°C to 75°C

Capacitance

Parameter	Symbol	Min	Typ	Max	Unit
Input pin capacitance	C_{IN}		4	6	pF
Output pin capacitance	C_{OUT}		6	8	pF

DC Characteristics

(V_{CC} = 0V, V_{EE} = −5.2V, Output Load = 50Ω to −2.0V, unless otherwise noted.)

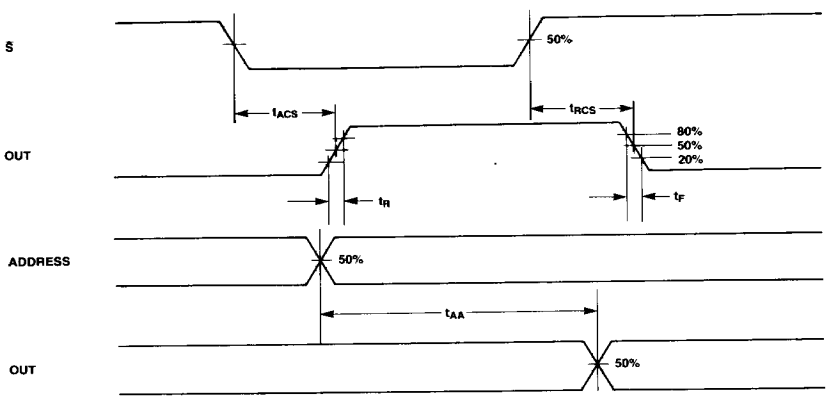
Parameter	Symbol	Min	Typ	Max	Unit	T_A
Output high voltage (V_{IN} = $V_{IH\ max}$ or $V_{IL\ min}$)	V_{OH}	−1000 −960 −900		−840 −810 −720	mV	0°C 25°C 75°C
Output low voltage (V_{IN} = $V_{IH\ max}$ or $V_{IL\ min}$)	V_{OL}	−1870 −1850 −1830		−1665 −1650 −1625	mV	0°C 25°C 75°C
Output high voltage (V_{IN} = $V_{IH\ min}$ or $V_{IL\ max}$)	V_{OHC}	−1020 −980 −920			mV	0°C 25°C 75°C
Output low voltage (V_{IN} = $V_{IH\ min}$ or $V_{IL\ max}$)	V_{OLC}			−1645 −1630 −1605	mV	0°C 25°C 75°C
Input high voltage (guaranteed input voltage high for all inputs)	V_{IH}	−1145 −1105 −1045		−840 −810 −720	mV	0°C 25°C 75°C
Input low voltage (guaranteed input voltage low for all inputs)	V_{IL}	−1870 −1850 −1830		−1490 −1475 −1450	mV	0°C 25°C 75°C
Input high current (V_{IN} = $V_{IH\ max}$)	I_{IH}			220	μA	0°C to 75°C
Input low current (V_{IN} = $V_{IL\ min}$)	I_{IL}	−50			μA	0°C to 75°C
$\overline{S}$ input low current (V_{IN} = $V_{IL\ min}$)	I_{IL}	0.5		170	μA	0°C to 75°C
Power supply current (all inputs and outputs open)	I_{EE}	−260			mA	0°C to 75°C

AC Characteristics
(Full Guaranteed Operating Ranges, Output Load = 50Ω to −2.0V and 30pF to GND and Airflow ≥2.5 m/s unless otherwise noted.)

Read Cycle

Parameter	Symbol	Min	Typ	Max	Unit
Address access time	t_{AA}	4	12	15	ns
Chip select access time	t_{ACS}	2	6	10	ns
Chip select recovery time	t_{RCS}	2	6	10	ns

Read Cycle Timing Diagram

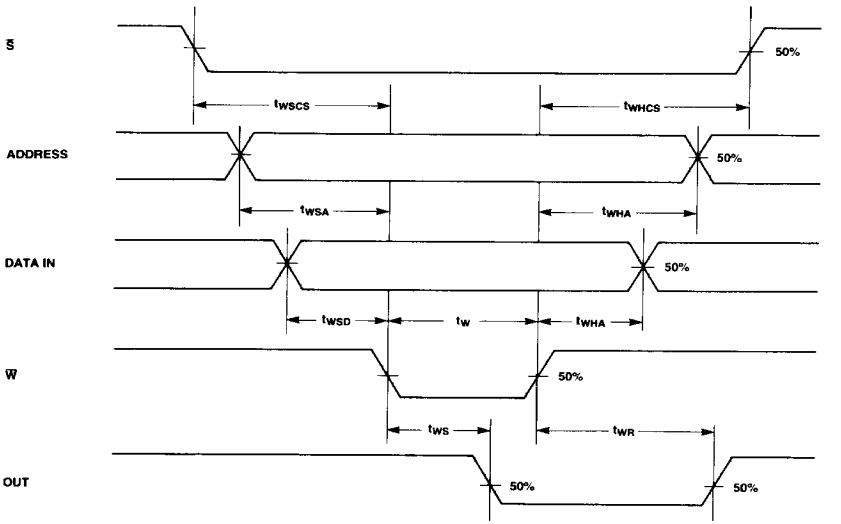


Write Cycle

Parameter	Symbol	Min	Typ	Max	Unit
Write pulse width	t_W	12			ns
Write disable time	t_{WS}			10	ns
Write recovery time	t_{WR}			12	ns
Address set up time	t_{WSA}	2.5			ns
Chip select set up time	t_{WSCS}	1.5			ns
Data set up time	t_{WSD}	1.5			ns
Address hold time	t_{WHA}	0.5			ns
Chip select hold time	t_{WHCS}	1.5			ns
Data hold time	t_{WHD}	1.5			ns

AC Characteristics
(Continued)

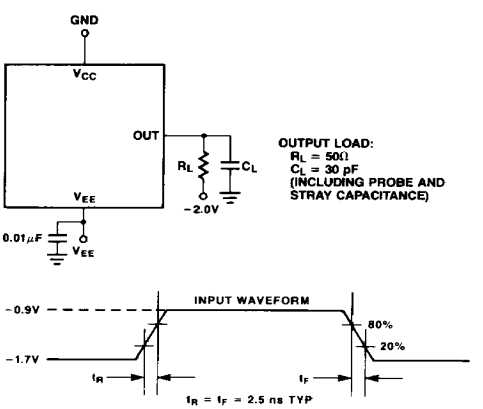
Write Cycle Timing Diagram



Rise Time and Fall Time

Parameter	Symbol	Min	Typ	Max	Unit
Output rise time	t_r	1.0	2.0	5.0	ns
Output fall time	t_f	1.0	2.0	5.0	ns

AC Test Conditions



NOTE: ALL TIMING MEASUREMENTS REFERENCED 50% INPUT LEVELS.

Package Dimensions
(Continued)
Dimensions in inches
(millimeters)

32-Lead Ceramic (Metal Seal) Dual In-Line Package
(Case No.: DIP-32C-A01)