

ECL 4096-BIT BIPOLAR RANDOM ACCESS MEMORY

DESCRIPTION

The Fujitsu MBM10470A is a fully decoded 1024-bit ECL read/write random access memory designed for high-speed scratch pad, control and buffer storage applications. This device is organized as 4096 words by one-bit and features on-chip voltage compensation for improved noise margin.

The MBM10470A offers extremely small cell and chip size, realized through the use of Fujitsu's patented DOPOS (Doped Polysili-

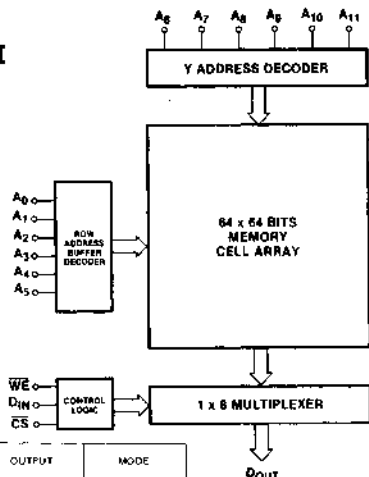
con), as well as IOP (Isolation by Oxide and Polysilicon) processing. As a result, very fast access time with high yields and outstanding device reliability are achieved in volume production.

Operation for the MBM10470A is specified over a temperature range of from 0°C to 75°C (ambient). It features frit-sealed 18-pin dual in-line packaging, and is fully compatible with industry-standard 10K-series ECL families.

FEATURES

- 4096 words x 1-bit organization
- On-chip voltage compensation for improved noise margin
- Fully compatible with Industry-standard 10K-series ECL families
- Address access time:
MBM10470A-20 20ns Max.
13ns Typ.
- Chip select access time:
15ns Max.
5ns Typ.
- Open emitter output for ease of memory expansion
- Low Power dissipation:
MBM10470A-20 0.19mW/bit
- DOPOS and IOP processing
- Pin compatible with the F10470

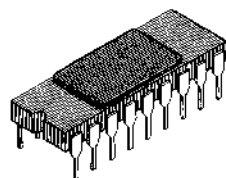
MBM10470A BLOCK DIAGRAM



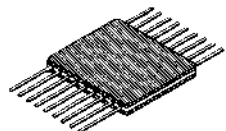
TRUTH TABLE

INPUT		D _{IN}	OUTPUT	MODE
ES	WE			
H	X	X	L	DISABLED
L	L	H	L	WRITE "H"
L	L	L	L	WRITE "L"
L	H	X	D _{OUT}	READ

H = High Voltage Level
L = Low Voltage Level
X = Don't care

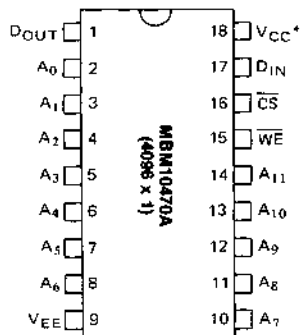


**CERAMIC PACKAGE
DIP-18C-F02**



**CERAMIC PACKAGE
FPT-18C-C01**

PIN ASSIGNMENT



**Note: DIP and Flatpack Styles
both conform to this
pin assignment.**

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.

ABSOLUTE MAXIMUM RATINGS (See Note)

Rating	Symbol	Value	Unit
V _{EE} Pin Potential to Ground Pin (V _{CC})	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}	-85 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.

GUARANTEED OPERATING CONDITIONS(Referenced to V_{CC})

Parameter	Symbol	Min	Typ	Max	Unit	Ambient Temperature
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	—	pF
Output Pin Capacitance	C _{OUT}	—	7	—	pF

DC CHARACTERISTICS(V_{CC} = 0V, V_{EE} = -5.2V, Output load = 50Ω to -2.0V and Airflow ≥ 2.5 m/s unless otherwise noted.)

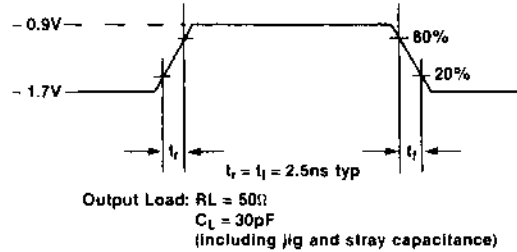
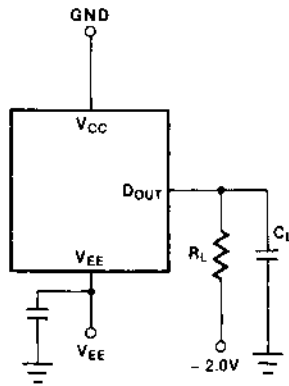
Parameter	Symbol	Min	Typ	Max	Unit	T _A
Output High Voltage (V _{IN} = V _{IH max.} or V _{IL min.})	V _{OH}	-1000 -960 -900	—	-840 -810 -720	mV	0°C 25°C 75°C
Output Low Voltage (V _{IN} = V _{IH max.} or V _{IL min.})	V _{OL}	-1870 -1850 -1830	—	-1665 -1650 -1625	mV	0°C 25°C 75°C
Output High Voltage (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° to 75°C
Input Low Current (V _{IN} = V _{IL min.})	I _{IL}	-50	—	—	μA	0° to 75°C
CS Input Low Current (V _{IN} = V _{IL min.})	I _{IL}	0.5	—	170	μA	0° to 75°C
Power Supply Current (All Inputs and Outputs Open)	I _{EE}	-200 -180	—	—	mA	0°C 75°C

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AC CHARACTERISTICS

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

AC TEST CONDITIONS

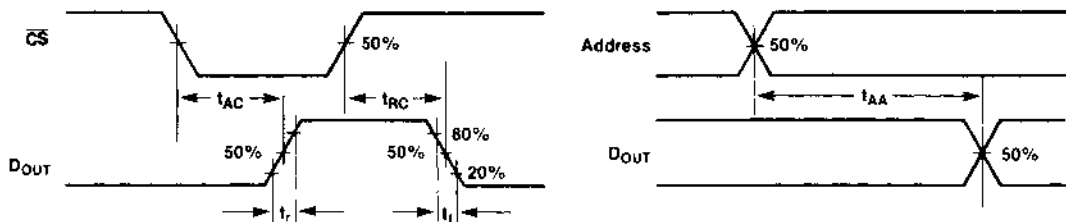


NOTE: All timing measurements referenced to 50% input levels.

READ CYCLE

Parameter	Symbol	MBM10470A-20		Unit
		Typ	Max	
Address Access Time	t_{AA}	13	20	ns
Chip Select Access Time	t_{AC}	—	15	ns
Chip Select Recovery Time	t_{RC}	—	15	ns

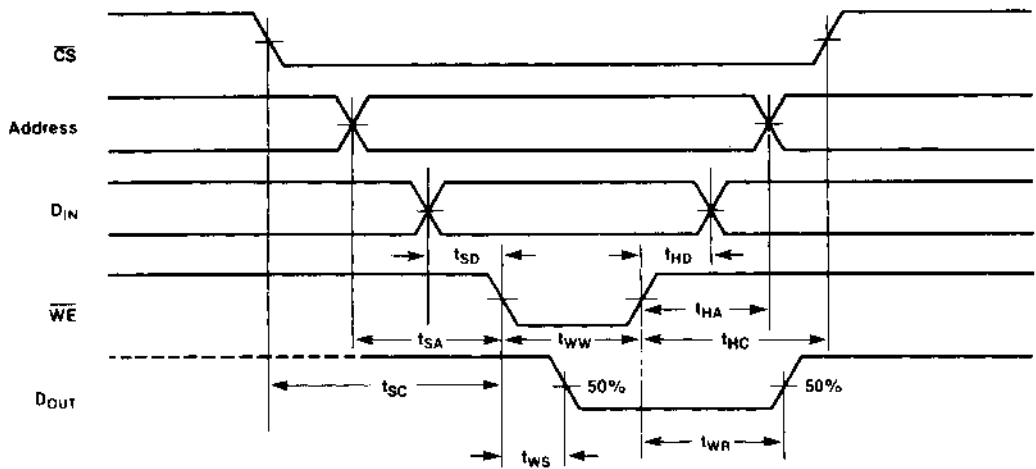
READ CYCLE



WRITE CYCLE

Parameter	Symbol	MBM10470A-20			Unit
		Min	Typ	Max	
Write Pulse Width	t_{WW}	15	6	—	ns
Write Disable Time	t_{WS}	—	—	15	ns
Write Recovery Time	t_{WR}	—	—	15	ns
Address Set Up Time	t_{SA}	3	0	—	ns
Chip Select Set Up Time	t_{SC}	2	0	—	ns
Data Set Up Time	t_{SD}	2	0	—	ns
Address Hold Time	t_{HA}	2	0	—	ns
Chip Select Hold Time	t_{HC}	2	0	—	ns
Data Hold Time	t_{HD}	2	0	—	ns

WRITE CYCLE



RISE TIME AND FALL TIME

Parameter	Symbol	MBM10470A-20		Unit
		Typ	Max	
Output Rise Time	t_r	3	—	ns
Output Fall Time	t_f	3	—	ns

TYPICAL CHARACTERISTICS CURVES

