

ECL 256-BIT BIPOLAR RANDOM ACCESS MEMORY

✓
MBM 10410

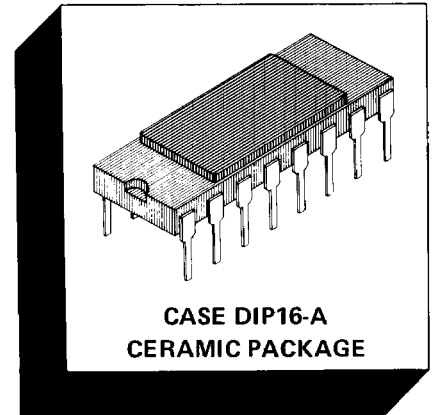
September 1978

256-BIT BIPOLAR ECL RANDOM ACCESS MEMORY

The MBM 10410 is an ECL 256-Bit Read/Write Random Access Memory (RAM), organized 256 words x 1 bit. It has a typical access time of 20 ns and is compatible with the 10K Logic family. It is designed for high-speed scratch pad and buffer storage applications.

Operation for the MBM 10410 is specified over a temperature range of from 0° to 75°C (ambient). It also features frit-sealed 16-pin dual-in-line packaging.

- 256 words x 1 bit organization
- Read access time, 15 ns typ.
- Chip select access time, 7 ns typ.
- Power dissipation, 1.8 mW/bit
- Simple memory expansion (3 chip selects)
- Output can be wired-OR for easy memory expansion
- Standard 16-lead DIP
- Pin compatible with the F10410

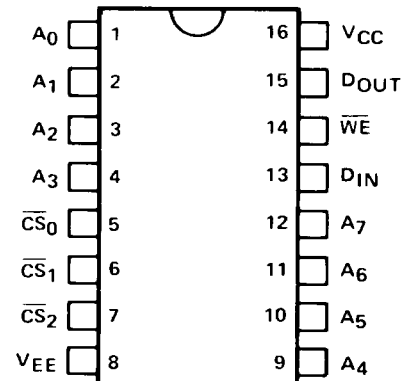


ABSOLUTE MAXIMUM RATINGS (See Note)

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}	-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.

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.

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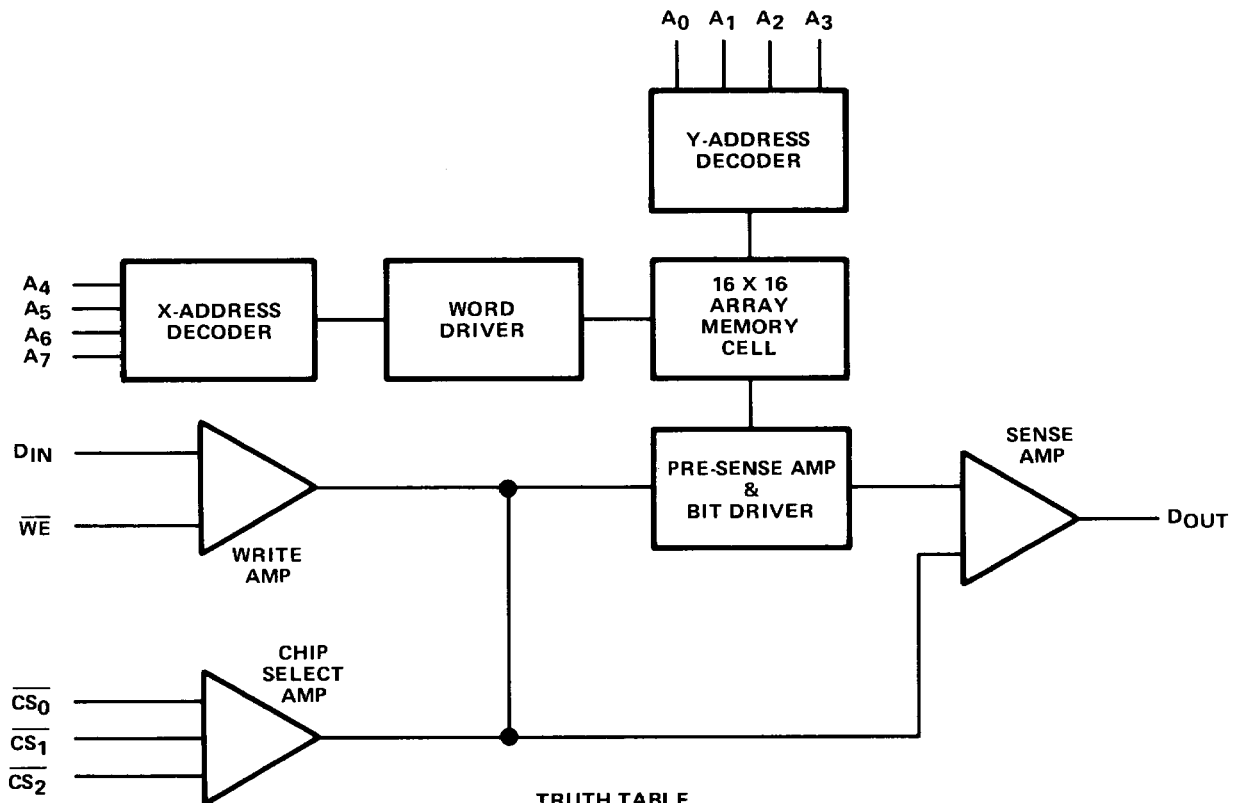
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Fig. 1 – MBM 10410 BLOCK DIAGRAM



TRUTH TABLE

INPUT			OUTPUT	MODE
CS	\overline{WE}	DIN		
H	X	X	L	DISABLED
L	L	H	L	WRITE "H"
L	L	L	L	WRITE "L"
L	H	X	DOUT	READ

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

CAPACITANCE

Parameter	Symbol	MBM 10410			Unit
		Min.	Typ.	Max.	
Input Pin Capacitance	C _{IN}	—	4	5	pF
Output Pin Capacitance	C _{OUT}	—	7	8	pF

GUARANTEED OPERATING CONDITIONS

Part Number	Supply Voltage (V_{EE})			Ambient Temperature
	Min.	Typ.	Max.	
MBM 10410	-5.46V	-5.2V	-4.94V	0°C to 75°C

DC CHARACTERISTICS

($V_{CC} = 0V$, $V_{EE} = -5.2V$, Output Load = 50Ω to $-2.0V$, airflow ≥ 2.5 m/s, unless otherwise noted.)

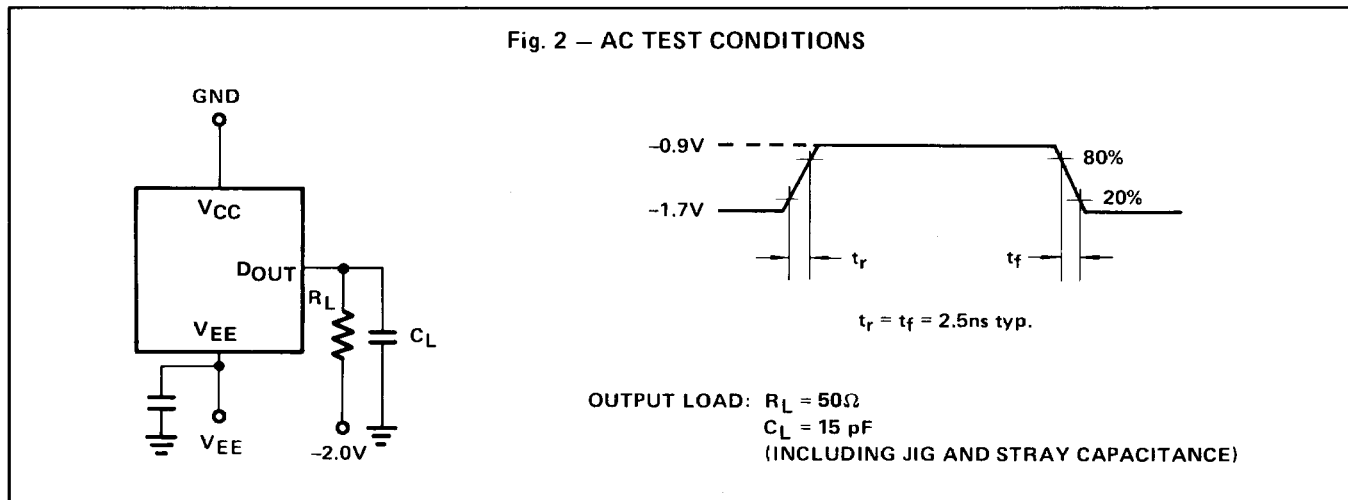
Parameter	NOTES	Symbol	Min.	Typ.	Max.	Unit	T_A
Output High Voltage ($V_{IN} = V_{IHmax}$ or V_{ILmin})		V_{OH}	-1000 -960 -900	-	-840 -810 -720	mV	0°C 25°C 75°C
Output Low Voltage ($V_{IN} = V_{IHmax}$ or V_{ILmin})		V_{OL}	-1870 -1850 -1830	-	-1665 -1650 -1625	mV	0°C 25°C 75°C
Output High Voltage ($V_{IN} = V_{IHmin}$ or V_{ILmax})		V_{OHC}	-1020 -980 -920	-	-	mV	0°C 25°C 75°C
Output Low Voltage ($V_{IN} = V_{IHmin}$ or V_{ILmax})		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 ($V_{IN} = V_{IHmax}$)	①	I_{IH}	-	-	100	μA	0° to 75°C
Input Low Current ($V_{IN} = V_{ILmin}$)		I_{IL}	-50	-	-	μA	0° to 75°C
\overline{CS} Input Low Current ($V_{IN} = V_{ILmin}$)		I_{IL}	0.5	-	150	μA	0° to 75°C
Power Supply Current (All Inputs and Output Open)		I_{EE}	-120 - -130	- -80 -	- - -	mA	75°C 25°C 0°C

① Pins 5, 6, 7 $I_{IHmax} = 150\mu A$



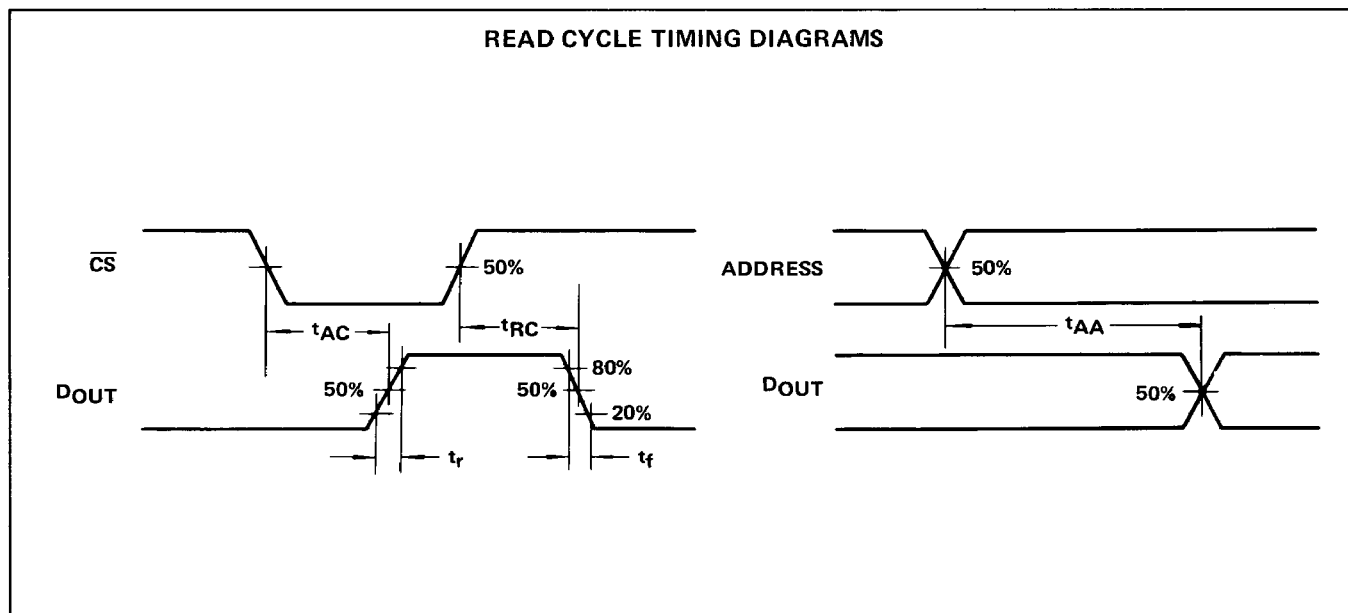
AC CHARACTERISTICS

($V_{CC} = 0V$, $V_{EE} = -5.2V \pm 5\%$, $T_A = 0^\circ$ to $+75^\circ C$, with transverse air flow ≥ 2.5 m/s Output Load = 50Ω to $-2V$ and 15 pF to GND unless otherwise noted.)



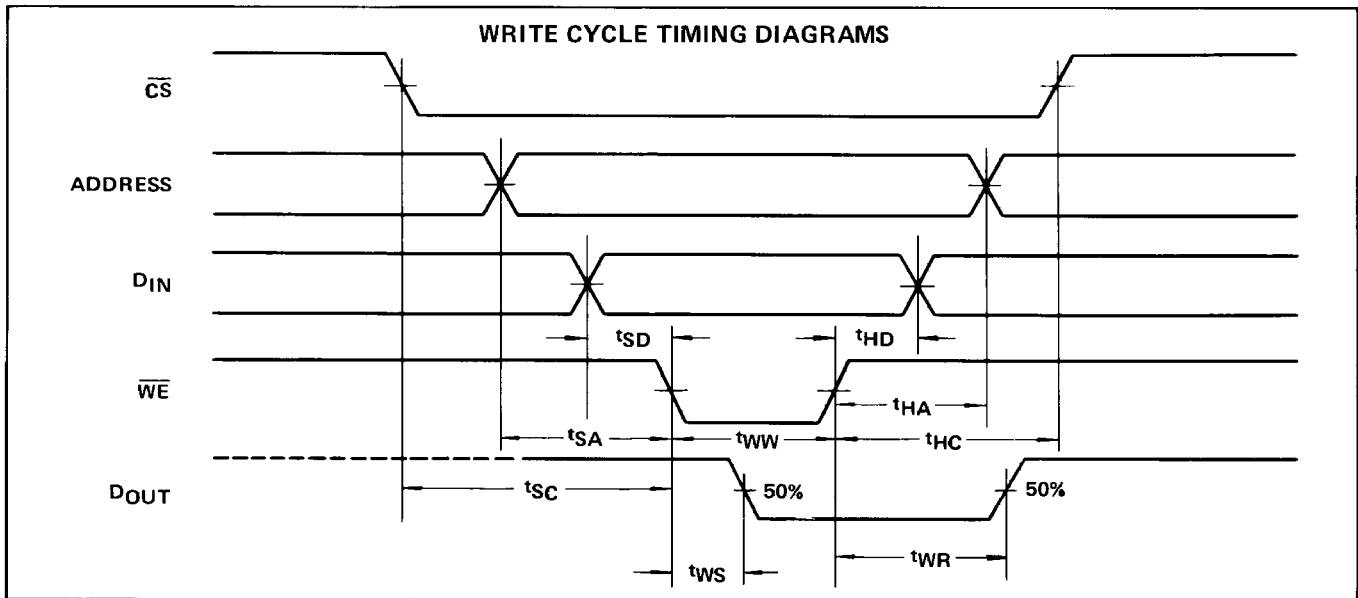
READ CYCLE

Parameter	Symbol	MBM 10410			Unit
		Min.	Typ.	Max.	
Address Access Time	t_{AA}	—	15	30	ns
Chip Select Access Time	t_{AC}	—	10	12	ns
Chip Select Recovery Time	t_{RC}	—	10	12	ns

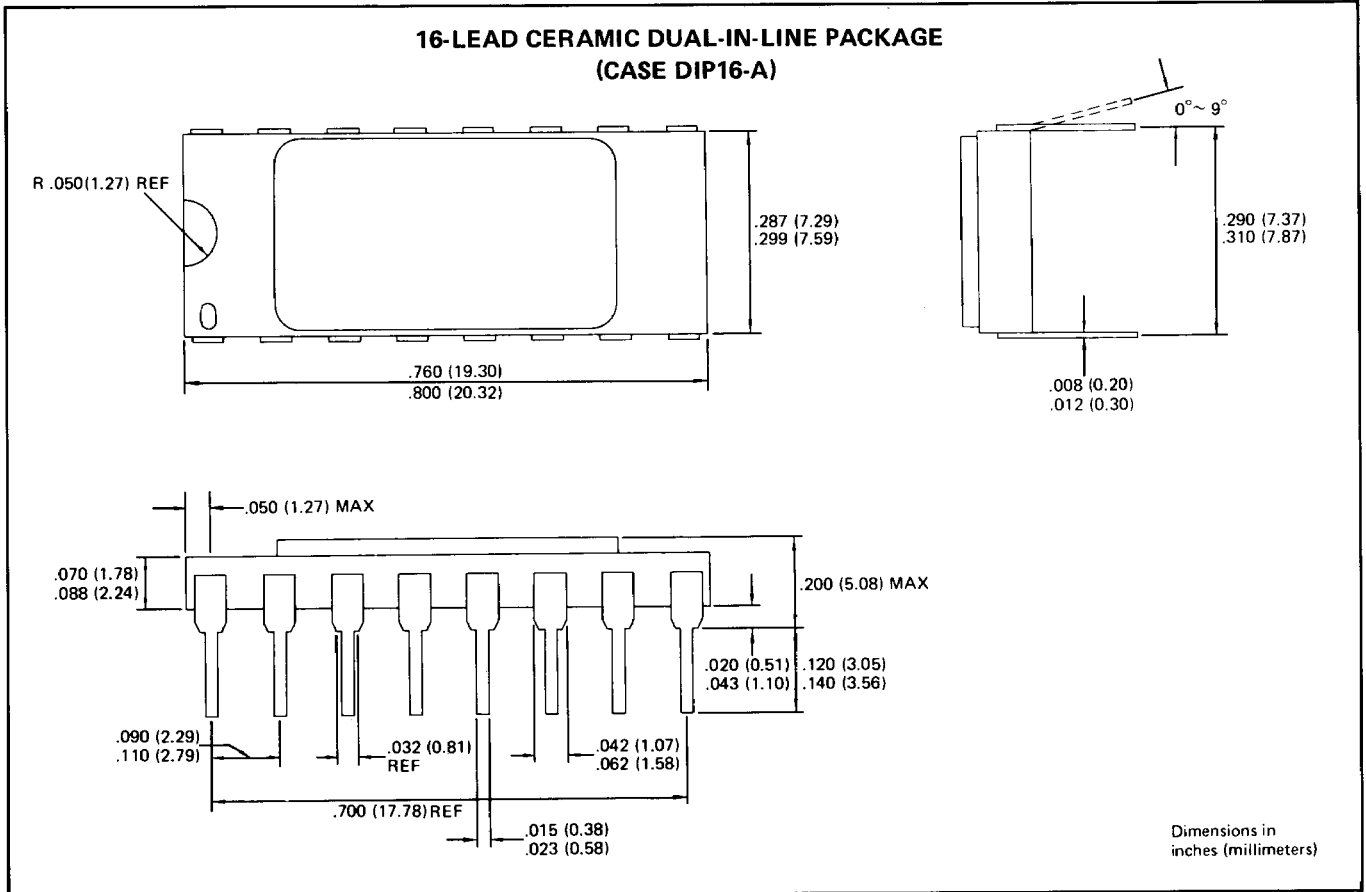


WRITE CYCLE

Parameter	Symbol	MBM 10410			Unit
		Min.	Typ.	Max.	
Write Pulse Width	t_{WW}	25	15	—	ns
Write Recovery Time	t_{WR}	—	8	20	ns
Write Disable Time	t_{WS}	—	7	12	ns
Address Set Up Time	t_{SA}	8	—	—	ns
Chip Select Set Up Time	t_{SC}	5	—	—	ns
Data Set Up Time	t_{SD}	5	—	—	ns
Address Hold Time	t_{HA}	5	—	—	ns
Chip Select Hold Time	t_{HC}	5	—	—	ns
Data Hold Time	t_{HD}	5	—	—	ns


RISE TIME and FALL TIME

Parameter	Symbol	MBM 10410			Unit
		Min.	Typ.	Max.	
Output Rise Time	t_r	—	3.0	—	ns
Output Fall Time	t_f	—	3.0	—	ns



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