

ECL 1024-BIT MB 7071N/E/H BIPOLAR RANDOM ACCESS MEMORY

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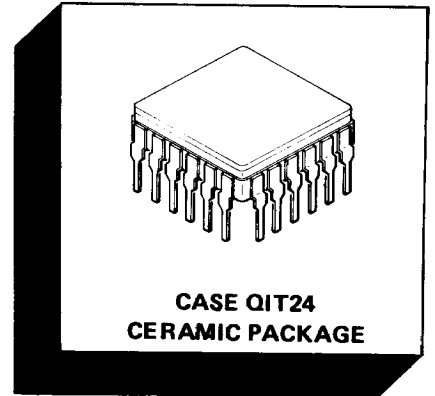
256x4 BIPOLAR ECL RANDOM ACCESS MEMORY

The Fujitsu MB 7071 N/E/H are fully decoded 1024-bit ECL read/write random access memories designed for high-speed scratch pad, control and buffer storage applications. The devices are organized as 256 words by 4 bits, and they feature on-chip voltage compensation for improved noise margin.

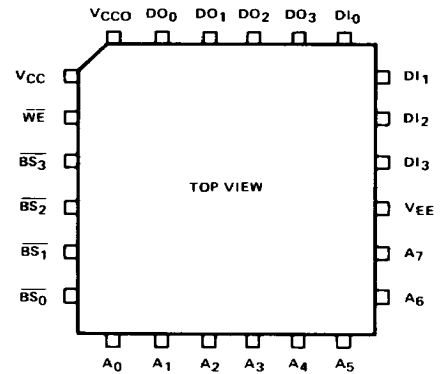
The MB 7071 N/E/H offer extremely small cell and chip sizes, realized through the use of Fujitsu's patented DOPOS (Doped Polysilicon), as well as IOP (Isolation by Oxide and Polysilicon) processing. As a result, very fast access time with high yields and outstanding device reliability are achieved in volume production.

Operation for the MB 7071 N/E/H is specified over a temperature range of from 0° to 75°C (ambient).

- 256 words x 4 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. (MB 7071N)
 - 12 ns max. (MB 7071E)
 - 10 ns max. (MB 7071H)
- DOPOS and IOP processing
- 4 block select pins for flexibility in organization



PIN ASSIGNMENT



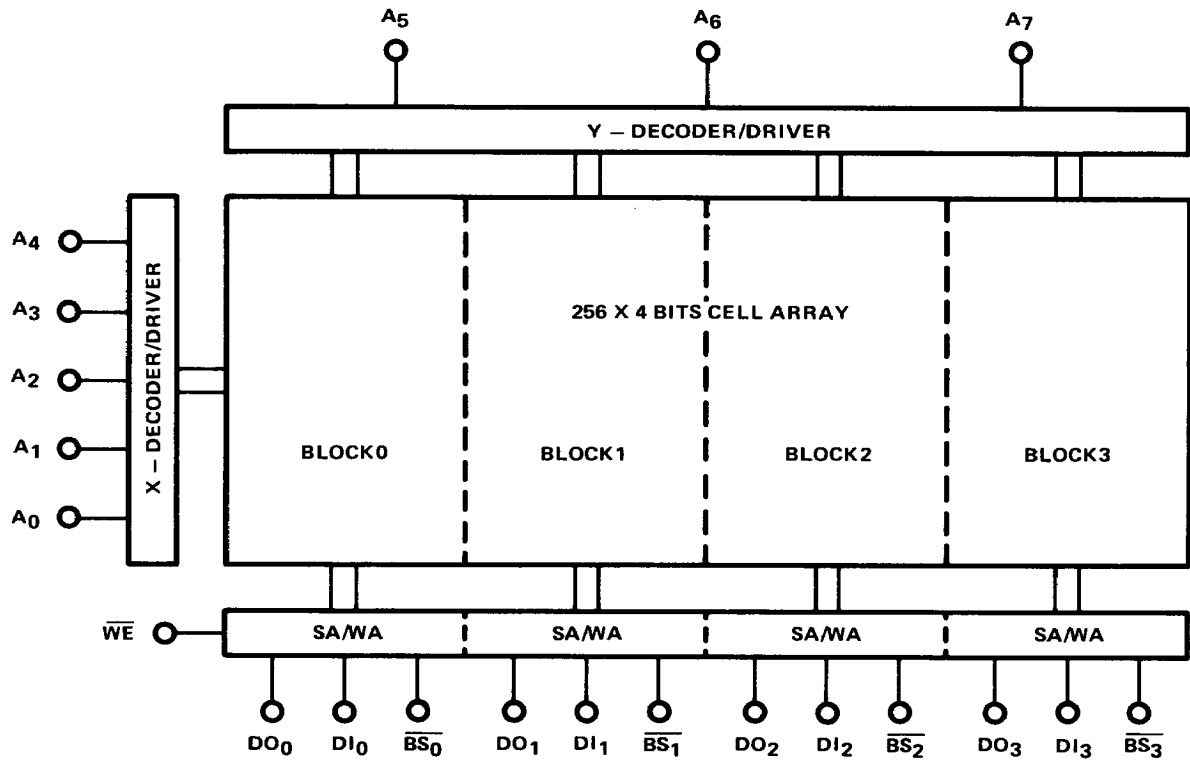
Small geometry bipolar integrated circuits are occasionally susceptible to damage from static voltages or electric fields. It is therefore advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this device.

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	-25 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.

Fig. 1 – MB 7071N/E/H BLOCK DIAGRAM



TRUTH TABLE

INPUT			OUTPUT	MODE
BS	WE	DI		
H	X	X	L	DISABLE
L	L	H	L	WRITE "H"
L	L	L	L	WRITE "L"
L	H	X	DO	READ

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

CAPACITANCE

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

GUARANTEED OPERATING RANGES

Part Number	Supply Voltage (V_{EE})			Ambient Temperature
	Min.	Typ.	Max.	
MB 7071N/E/H	-5.46V	-5.2V	-4.94V	0°C to 75°C

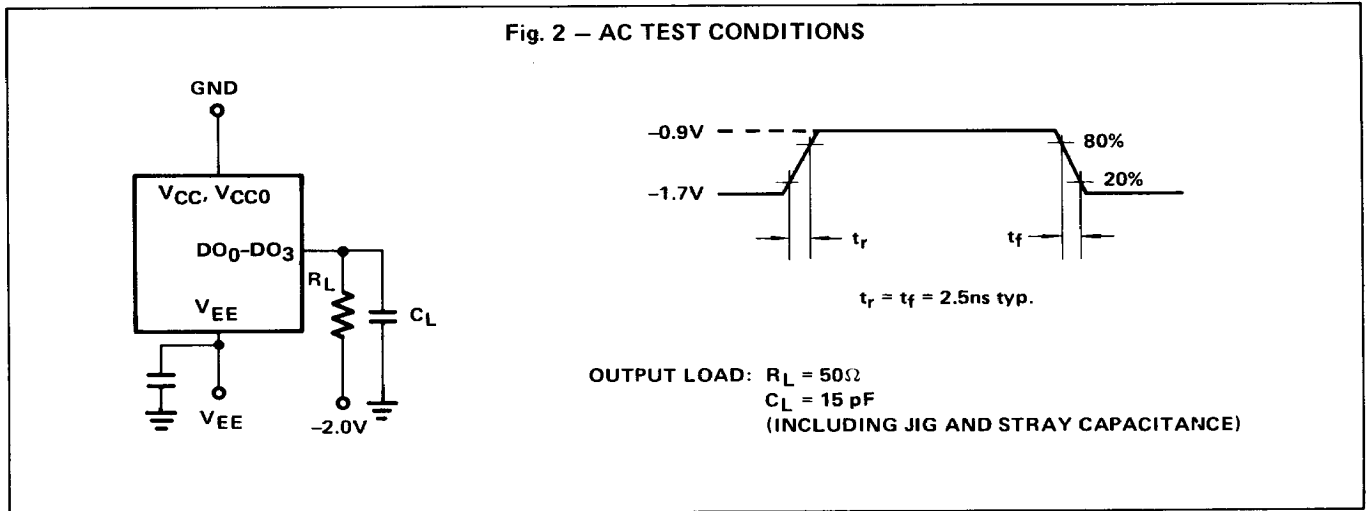
DC CHARACTERISTICS

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

Parameter	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 ($V_{IN} = V_{IHmax}$)	I_{IH}	-	-	220	μA	0° to 75°C
Input Low Current ($V_{IN} = V_{ILmin}$)	I_{IL}	0.5	-	170	μA	0° to 75°C
Power Supply Current (All Inputs and Output Open)	I_{EE}	-200	-160	-	mA	0° to 75°C

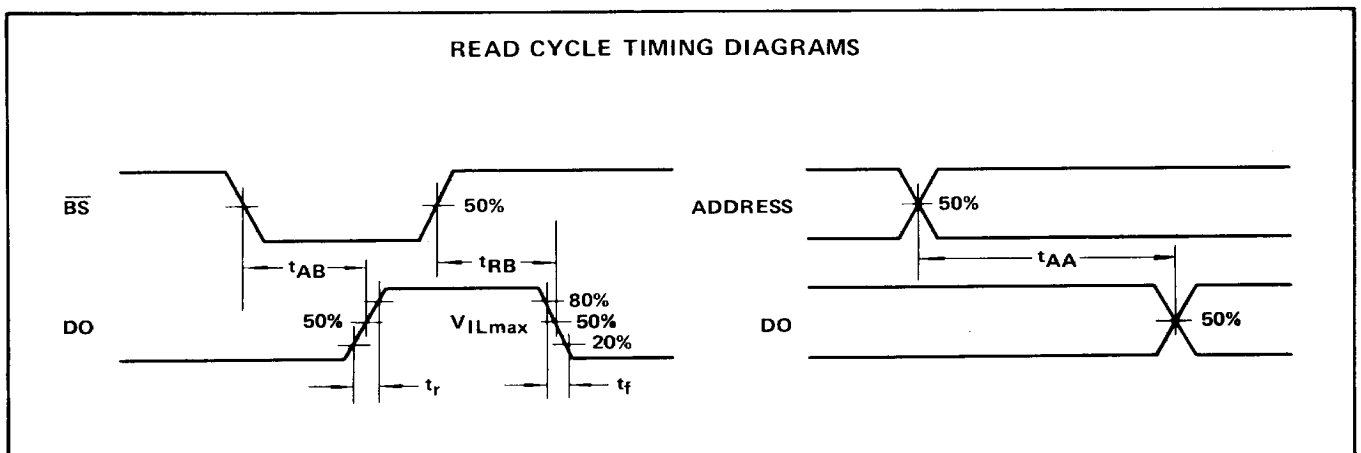
AC CHARACTERISTICS

($V_{CC} = V_{CC0} = 0V$, $V_{EE} = -5.2V \pm 5\%$, $T_A = 0^\circ$ to $+75^\circ C$ with transverse airflow ≥ 2.5 m/s, Output Load = 50Ω to $-2V$ and 15 pF to GND, unless otherwise noted.)



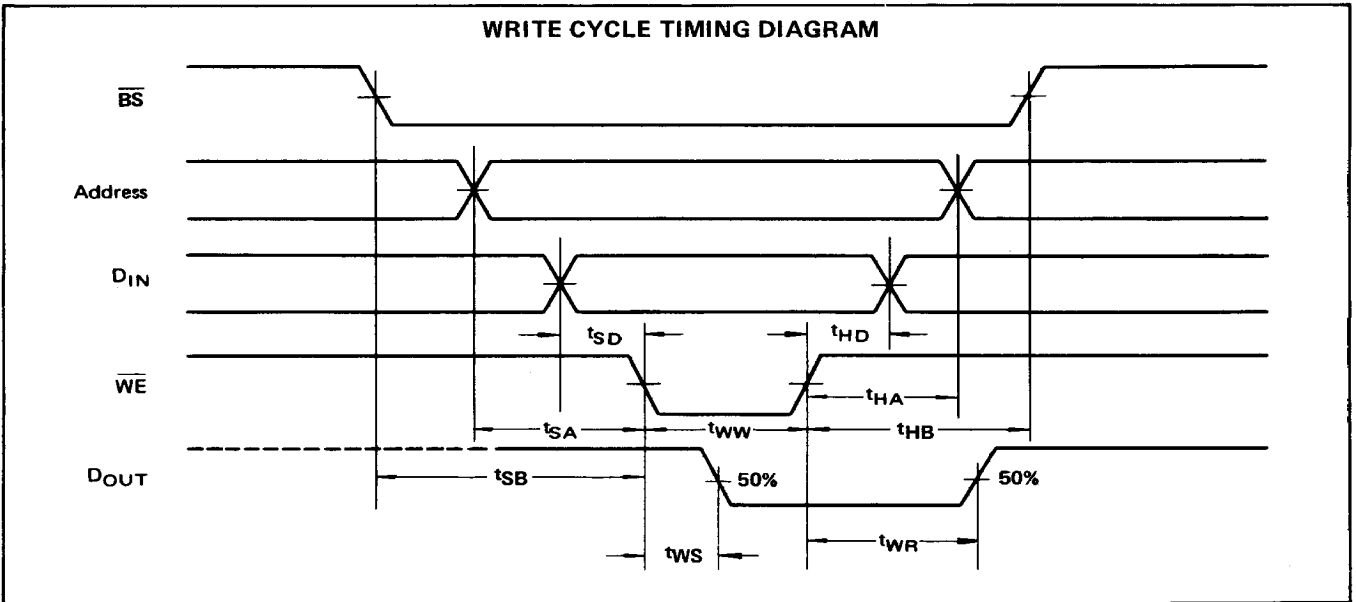
READ CYCLE

Parameter	Symbol	MB 7071N			MB 7071E			MB 7071H			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Address Access Time	t_{AA}	–	–	15	–	–	12	–	7.5	10	ns
Block Select Access Time	t_{AB}	–	3.0	5.0	–	3.0	5.0	–	3.0	4.5	ns
Block Select Recovery Time	t_{RB}	–	3.0	5.0	–	3.0	5.0	–	3.0	4.5	ns



WRITE CYCLE

Parameter	Symbol	MB 7071N			MB 7071E			MB 7071H			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Write Pulse Width	t_{WW}	10.0	—	—	9.0	—	—	8.0	5.5	—	ns
Write Recovery Time	t_{WR}	—	6.0	9.0	—	6.0	9.0	—	6.0	9.0	ns
Write Disable Time	t_{WS}	—	3.0	5.0	—	3.0	5.0	—	3.0	5.0	ns
Address Set Up Time	t_{SA}	3.0	—	—	3.0	—	—	2.0	—	—	ns
Block Select Set Up Time	t_{SB}	2.0	—	—	2.0	—	—	2.0	—	—	ns
Data Set Up Time	t_{SD}	2.0	—	—	2.0	—	—	2.0	—	—	ns
Address Hold Time	t_{HA}	2.0	—	—	2.0	—	—	2.0	—	—	ns
Block Select Hold Time	t_{HB}	2.0	—	—	2.0	—	—	2.0	—	—	ns
Data Hold Time	t_{HD}	2.0	—	—	2.0	—	—	2.0	—	—	ns



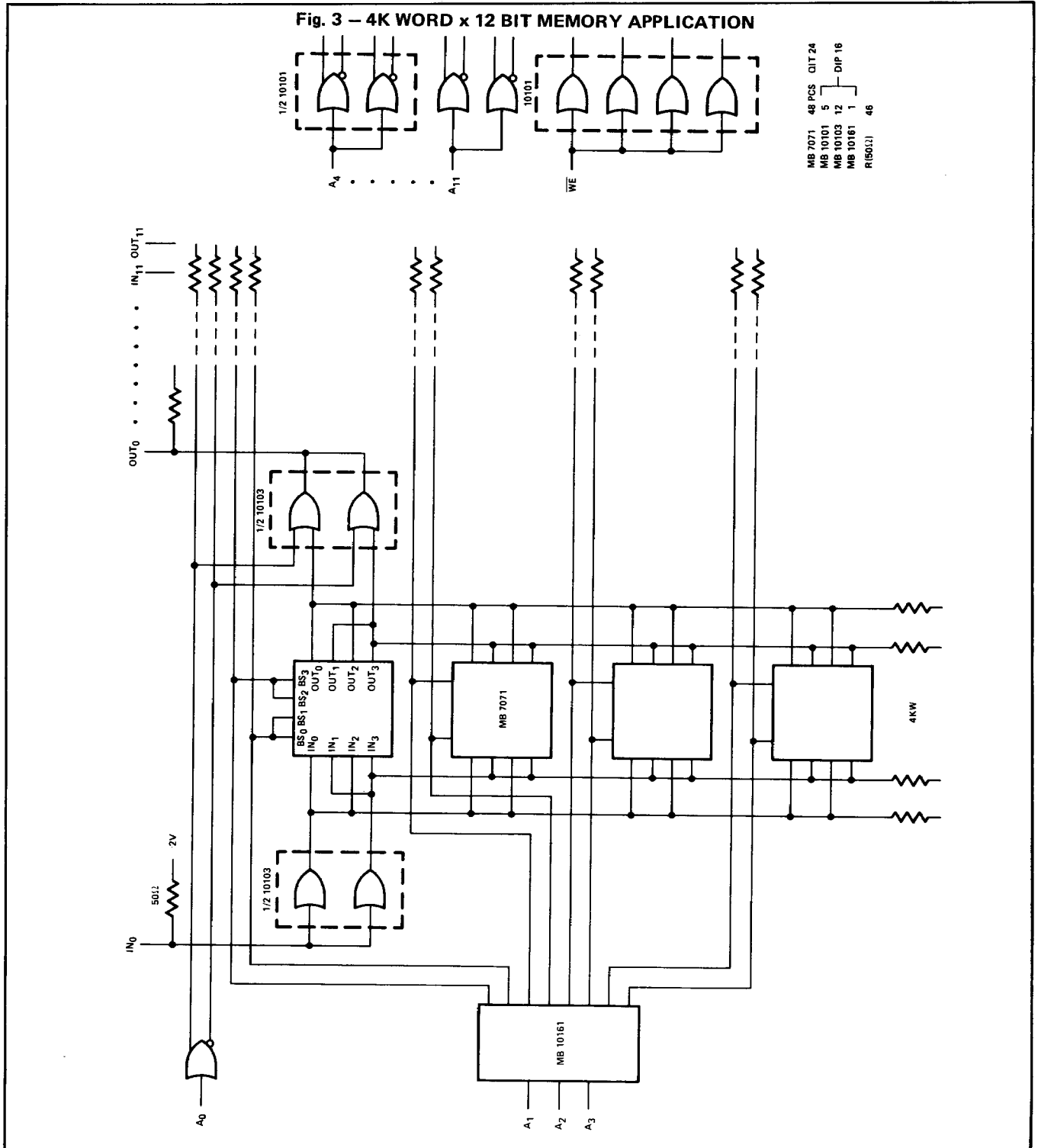
RISE TIME and FALL TIME

Parameter	Symbol	MB 7071N			MB 7071E			MB 7071H			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Output Rise Time	t_r	—	3.0	—	—	3.0	—	—	3.0	—	ns
Output Fall Time	t_f	—	3.0	—	—	3.0	—	—	3.0	—	ns



MB 7071N/E/H

APPLICATION INFORMATION



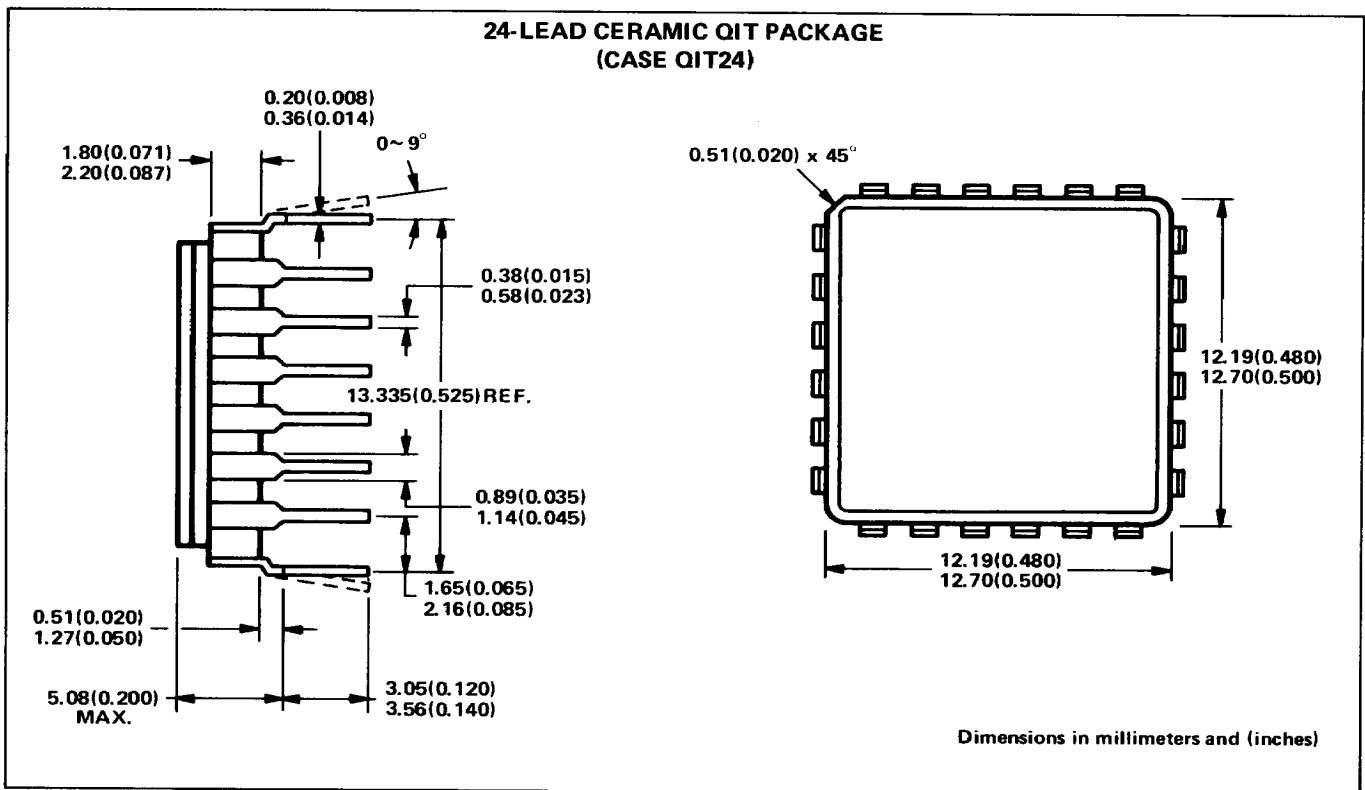
APPLICATION INFORMATION

The Fujitsu MB 7071N/E/H is a fully decoded 256 word by 4 bits ECL memory. With its high speed it is

ideally suited to mainframe applications. These include cache and micro-program control. In Figure 3 is illustrated one such application. Here is shown a 4K word x 12 bit memory.

As with all ECL memory systems extreme care must be taken in PC board layout and bussing to minimize reflections and crosstalk.

PACKAGE DIMENSIONS



Circuit diagrams utilizing Fujitsu products are included as a means of illustrating typical semiconductor applications; consequently, complete information sufficient for construction purposes is not necessarily given. The information has been carefully checked and is believed to be entirely reliable. However, no responsibility is assumed for inaccuracies. Furthermore, such information does not convey to the purchaser of the semiconductor devices described herein any license under the patent rights of Fujitsu Limited or others. Fujitsu Limited reserves the right to change device specifications.