November 1990
Edition 1.0

FUJITSU

DATA SHEET

MB834000A/AL

CMOS 4M-BIT MASK READ ONLY MEMORY

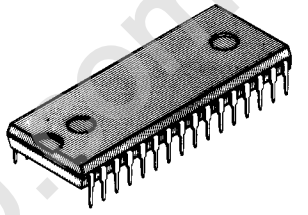
512K x 8 CMOS MASK READ ONLY MEMORY

The Fujitsu MB834000A/AL is a CMOS Si-gate mask-programmable static read only memory organized as 524, 288 words by 8 bits.

All pins are TTL-compatible and 3-state output level. The device is fully-static operatable (i.e. no need of clock signal) with a single +5V power supply. Also, the MB834000AL can be used with a single +3V power supply which is required for battery powered applications.

The MB834000A/AL is designed for applications such as character generator and program strage which require large memory capacity and high-speed/low-power operation.

- Organization: 524, 288 words x 8 bits
- Access time: 200ns max. @ Vcc = 5V (MB834000A)
  400ns max. @ Vcc = 3V (MB834000AL)
- Completely static operation: No clock required
- TTL compatible Input/Output
- Three state output
- Single +5V power supply (MB834000A/AL)
  Single +3V power supply (MB834000AL)
- Power dissipation: 220mW max. (Active) @ Vcc = 5V (MB834000A/AL)
  40mW max. (Active) @ Vcc = 3V (MB834000AL)
- JEDEC standard 32-pin Plastic DIP: Suffix: P
- 32-pin Plastic Small Outline Package (SOP): Suffix: PF
- 32-pin Plastic Thin Small Outline Package (TSOP):
  Suffix: PFTN(Normal Bend)
  Suffix: PFTR(Reversed Bend)

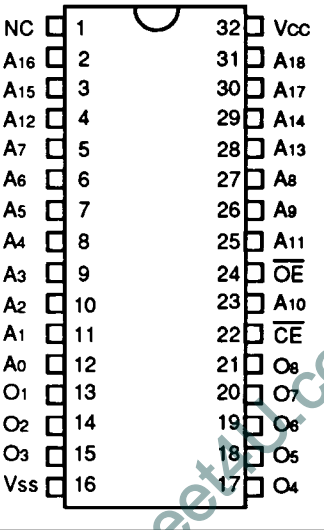


PLASTIC PACKAGE
DIP-32P-M01

FPT-32P-M03 See Page 6
FPT-32P-M04 See Page 7
FPT-32P-M05 See Page 8

PIN ASSIGNMENT

(TOP VIEW)



ABSOLUTE MAXIMUM RATINGS (see NOTE)

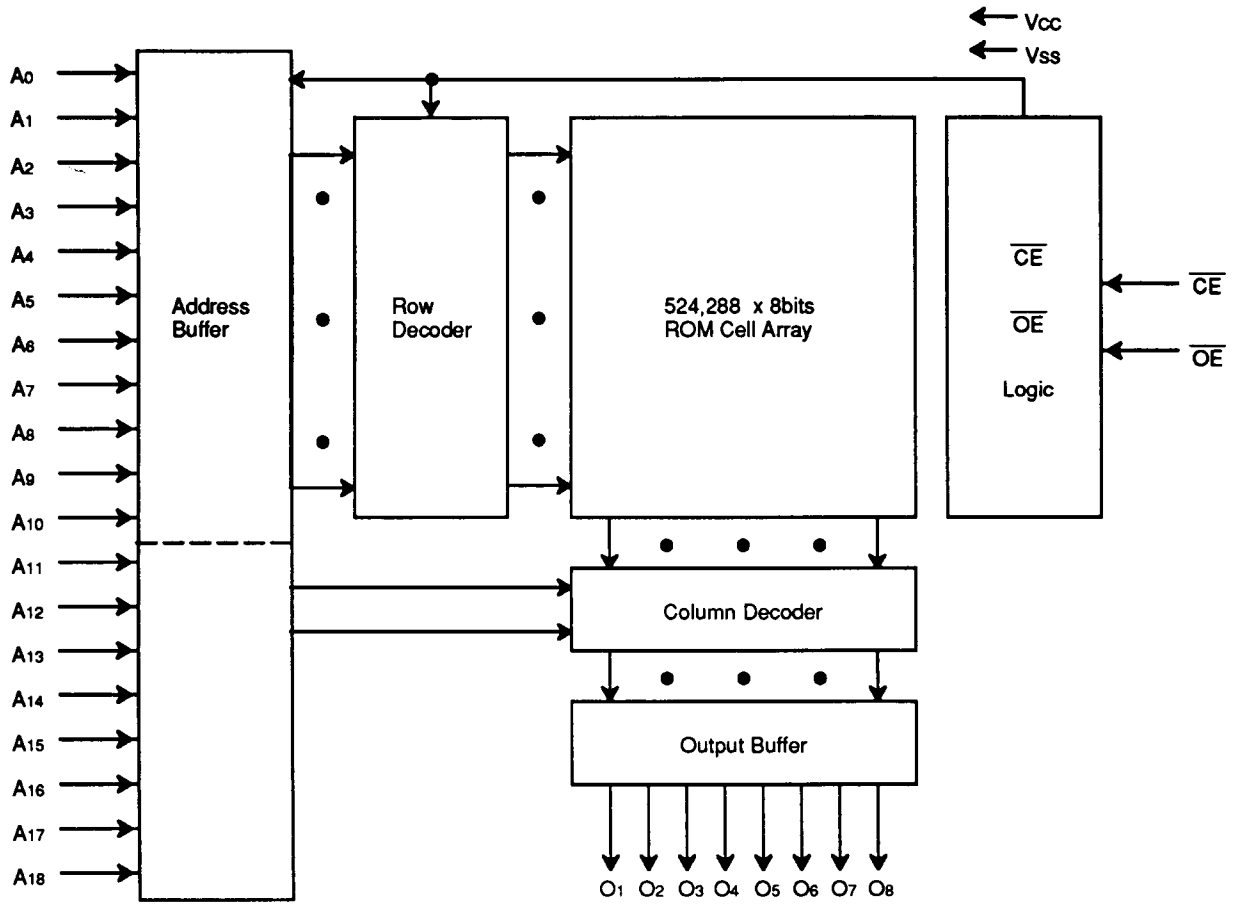
Rating	Symbol	Value	Unit
Supply Voltage	V_{CC}	−0.3 to +7.0 *	V
Input Voltage	V_{IN}	−0.5 to V_{CC} +0.5 *	V
Output Voltage	V_{OUT}	−0.5 to V_{CC} +0.5 *	V
Temperature Under Bias	T_{BIAS}	−10 to +85	°C
Storage Temperature Range	T_{STG}	−45 to +125	°C

*** Referenced to GND**

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

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.

Fig. 1 — MB834000A/AL BLOCK DIAGRAM



TRUTH TABLE

$\overline{CE}$	$\overline{OE}$	Mode	Output	Power Dissipation Mode
H	X	NOTSELECTED	High–Z	STANDBY
L	H	NOT SELECTED	High–Z	ACTIVE
L	L	SELECTED	DOUT	ACTIVE

CAPACITANCE (TA=25° C, f=1MHz)

Parameter	Symbol	Min	Typ	Max	Unit
Output Capacitance (VOUT=0V)	COUT			15	pF
Input Capacitance (VIN=0V)	CIN			10	pF

RECOMMENDED OPERATING CONDITIONS

(Referenced to GND)

Parameter	Symbol	MB834000A/AL			MB834000AL			Unit
		Min	Typ	Max	Min	Typ	Max	
Supply Voltage	V_{CC}	4.5	5.0	5.5	2.7	3.0	3.3	V
Ambient Temperature	T_A	0		70	0		70	°C

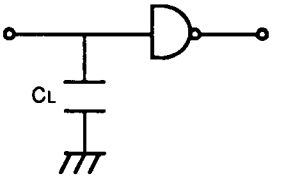
DC CHARACTERISTICS

(Recommended operating conditions unless otherwise noted.)

Parameter	Test Condition	Symbol	MB834000A/AL			MB834000AL			Unit
			Min	Typ	Max	Min	Typ	Max	
Active Supply Current	$\overline{CE}$=V_{IL}, Minimum Cycle Output = Open	I_{CC}			50			12	mA
Standby Supply Current	$\overline{CE}$=V_{IH}	I_{SB1}			1			0.5	mA
	$\overline{CE}$=V_{CC}=V_{IH}, V_{IN}=GND or V_{CC}	I_{SB2}			10			10	µA
Input Leakage Current	V_{IN}=0 to V_{CC}	I_{LI}	–10		10	–5		5	µA
Output Leakage Current	$\overline{CE}$=V_{IH} $\overline{OE}$=V_{IH}	$I_{LI/O}$	–10		10	–5		5	µA
Input Low Voltage		V_{IL}	–0.3		0.8	–0.3		0.6	V
Input High Voltage		V_{IH}	2.2		V_{CC}+0.3	V_{CC}x0.7		V_{CC}+0.3	V
Output High Voltage	I_{OH}=–400µA	V_{OH}	2.4			2.0			V
Output Low Voltage	I_{OL}=2.1mA	V_{OL}			0.4				V
	I_{OL}=1.0mA							0.4	

Fig. 2 — AC TEST CONDITIONS

- Input Pulse Level : 0.6 to 2.4V @V_{CC} = 5V (MB834000A/AL)
  0.4 to V_{CC}x0.8V @V_{CC} = 3V(MB834000AL)
- Input Pulse Rise and Fall Time : t_T=5ns
- Timing Reference Levels : Input: V_{IL}=0.8V, V_{IH}=2.2V / Output: V_{OL}=0.8V, V_{OH}=2.2V
  @V_{CC} = 5V (MB834000A/AL)
  : Input: V_{IL}=0.6V, V_{IH}=V_{CC}x0.7V / Output: V_{OL}=V_{OH}=1.5V
  @V_{CC} = 3V (MB834000AL)
  : 1 TTL Gate and 100pF
- Output Load



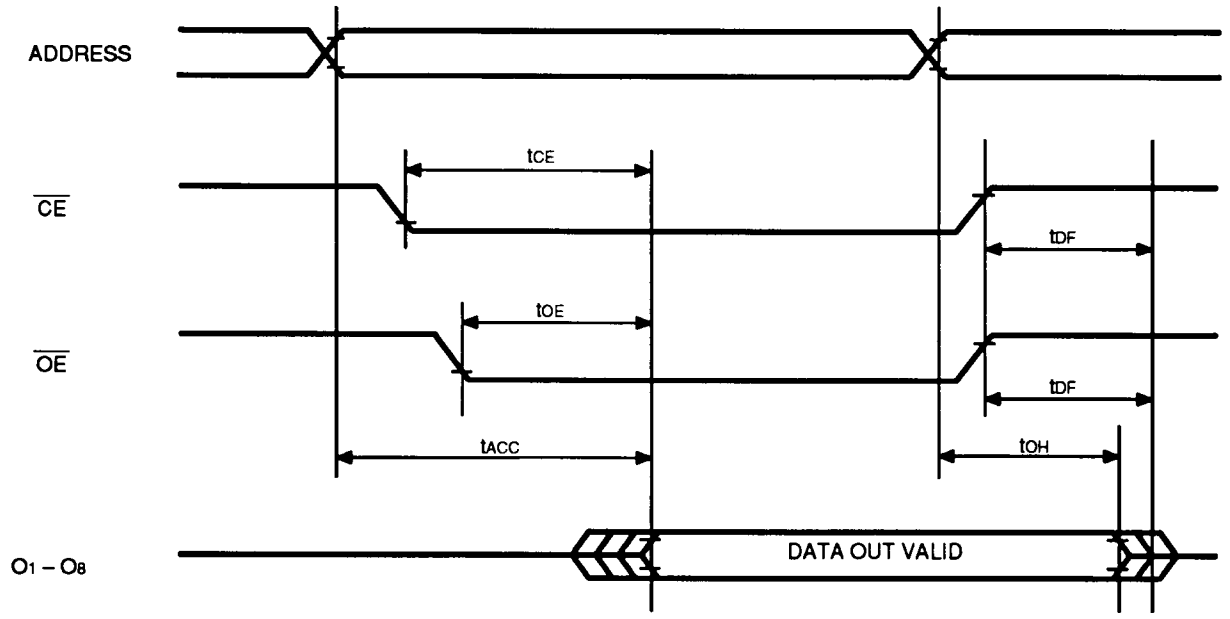
AC CHARACTERISTICS

(Recommended operating conditions unless otherwise noted.)

Parameter	Test Condition	Symbol	MB834000A/AL		MB834000AL		Unit
			Min	Max	Min	Max	
Address Access Time	$\overline{CE}$=$\overline{OE}$=V_{IL}	t_{ACC}		200		400	ns
Chip Enable Access Time	$\overline{OE}$=V_{IL}	t_{CE}		200		400	ns
Output Enable Access Time		t_{OE}		80		200	ns
Output Disable Time*2		t_{DF}		60		120	ns
Output Hold Time	$\overline{CE}$=$\overline{OE}$=V_{IL}	t_{OH}	0		0		ns

*1: When contineously switching between 3V operation and 5V operation, during VCC transition the $\overline{CE}$ should be High state (Standby mode).
*2: tDF is specified by either of $\overline{CE}$ or $\overline{OE}$ changing to High earlier.

TIMING DIAGRAM

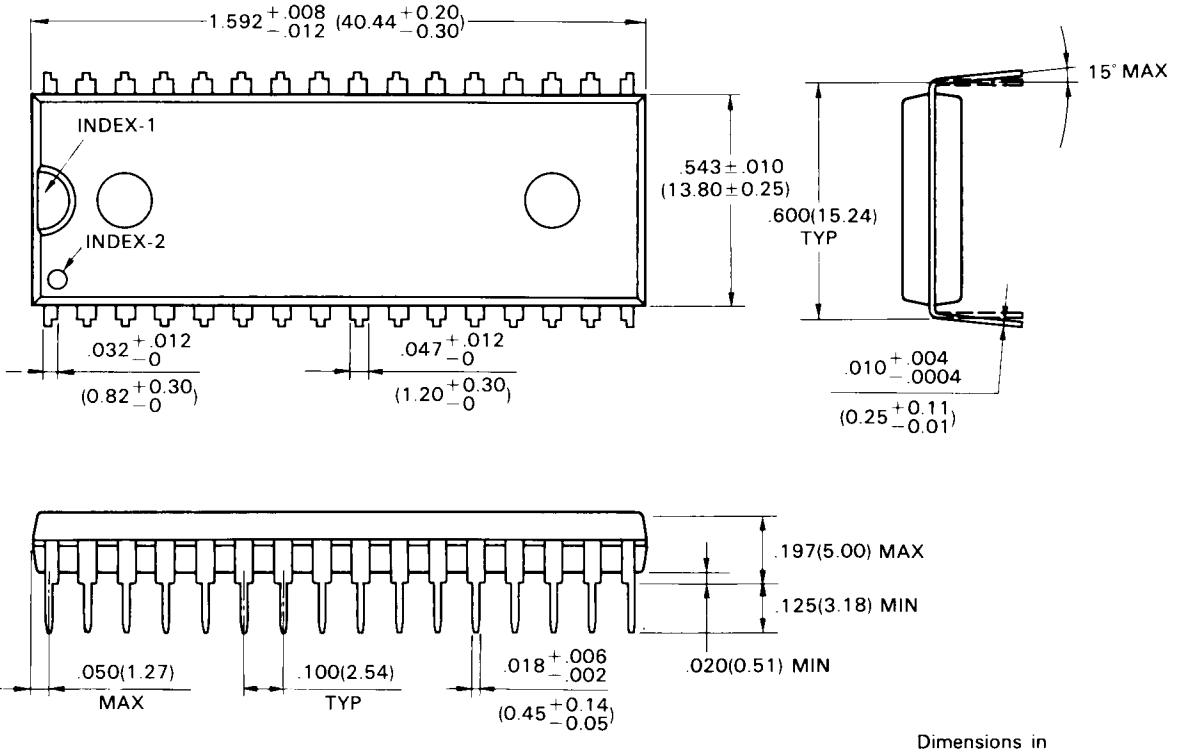


PACKAGE DIMENSIONS

(Suffix: P)

32-LEAD PLASTIC DUAL IN-LINE PACKAGE

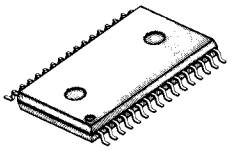
(Case No. : DIP-32P-M01)



Dimensions in inches (millimeters)

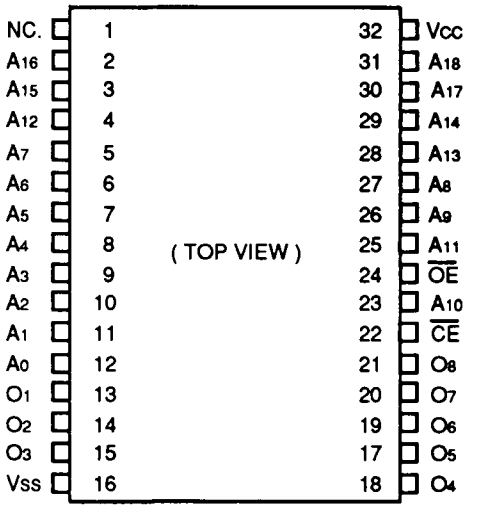
PACKAGE DIMENSIONS (Continued)

(Suffix: PF)

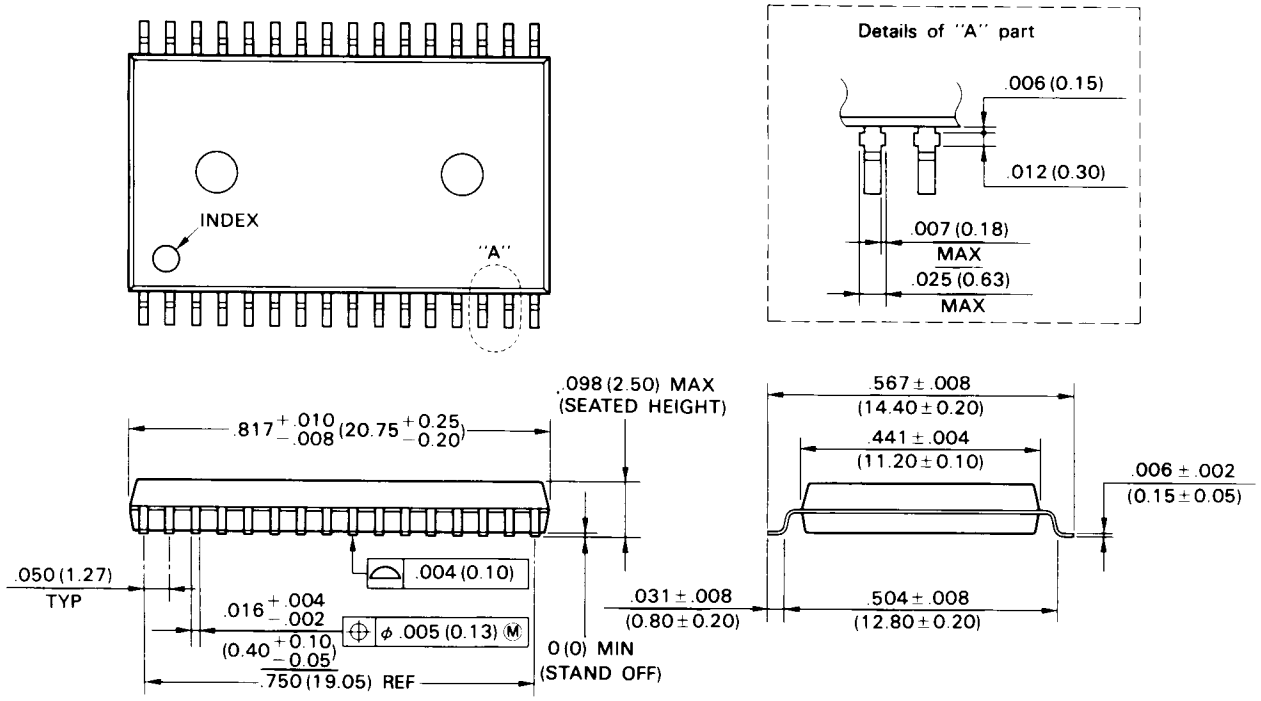


PLASTIC PACKAGE
FPT–32P–M03

PIN ASSIGNMENT



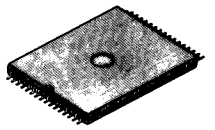
32-LEAD PLASTIC FLAT PACKAGE
(Case No. : FPT-32P-M03)



Dimensions in inches (millimeters)

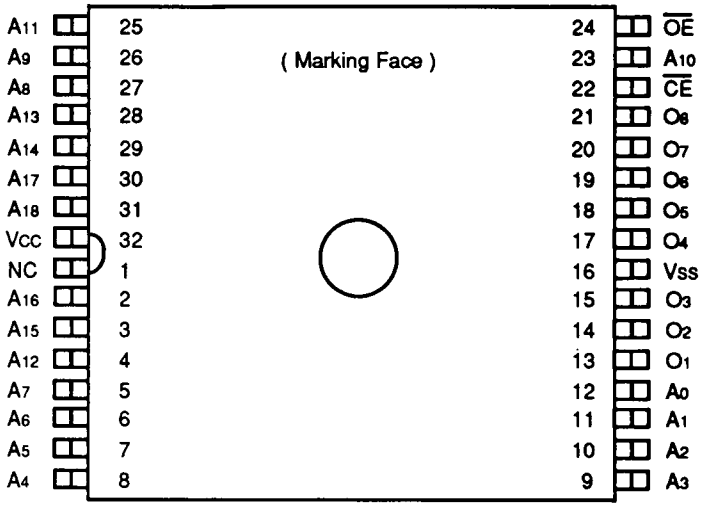
PACKAGE DIMENSIONS (Continued)

(Suffix: PFTN)

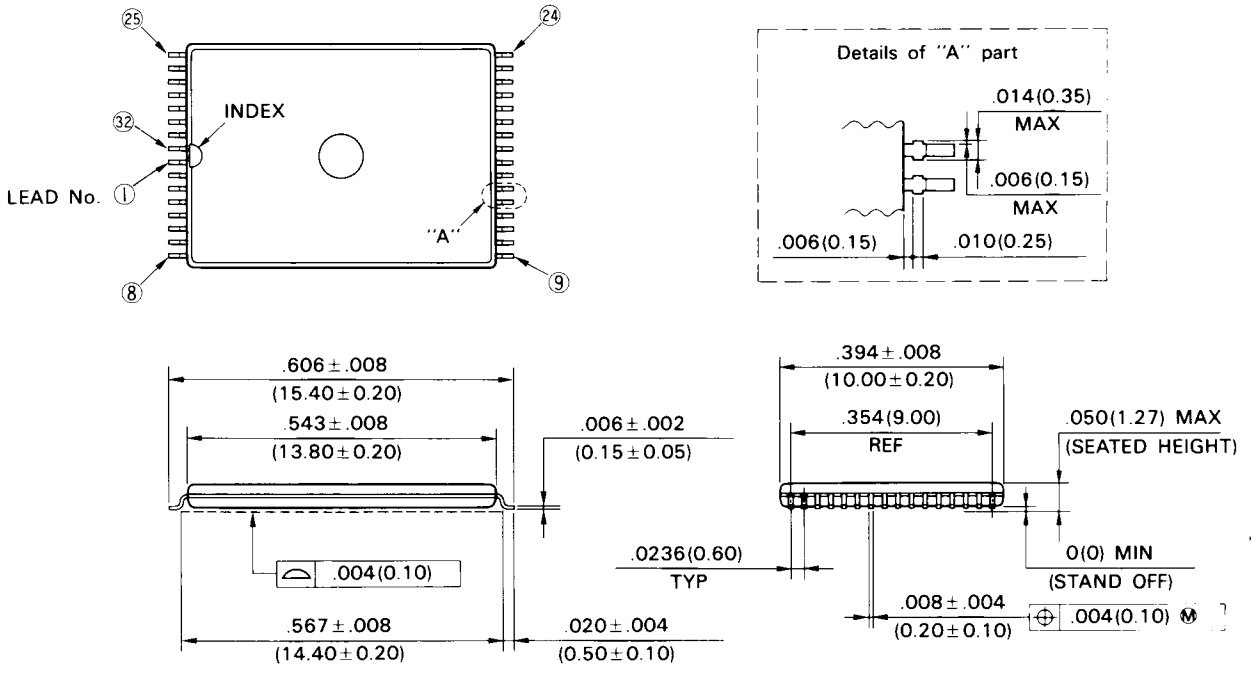


PLASTIC PACKAGE
FPT-32P-M04

PIN ASSIGNMENT
(Normal Bend)



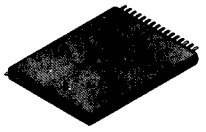
32-LEAD PLASTIC FLAT PACKAGE
(Case No. : FPT-32P-M04)



Dimensions in
inches (millimeters)

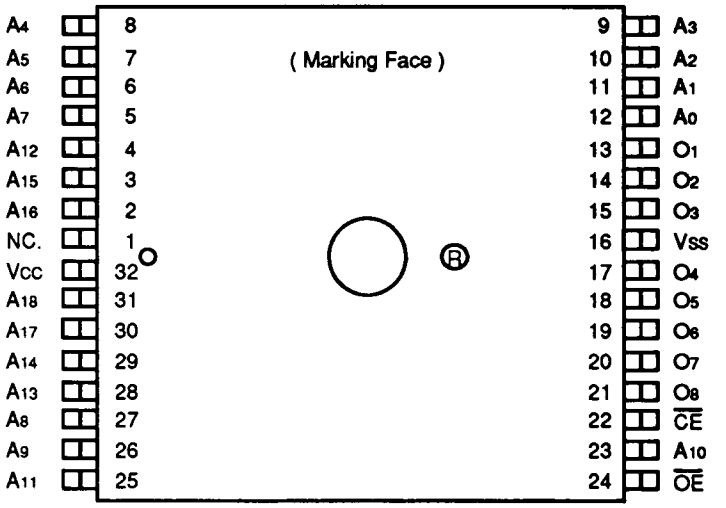
PACKAGE DIMENSIONS (Continued)

(Suffix: PFTR)

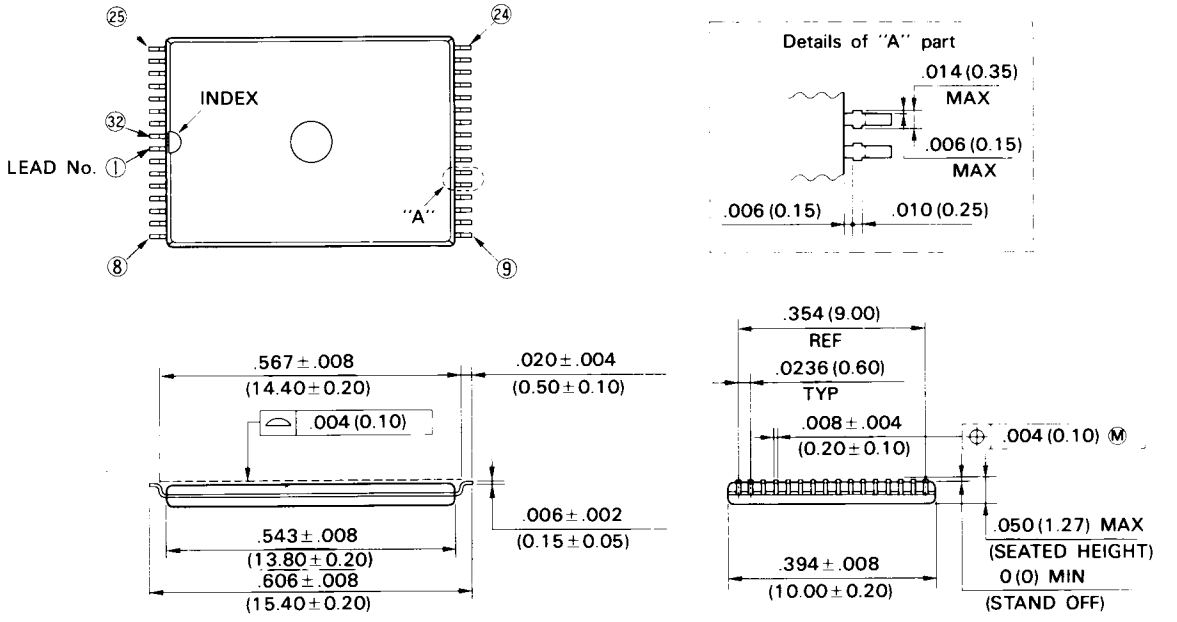


PLASTIC PACKAGE
FPT–32P–M05

PIN ASSIGNMENT
(Reversed Bend)



32-LEAD PLASTIC FLAT PACKAGE
(Case No. : FPT-32P-M05)



Dimensions in
inches (millimeters)