

# MOSTEK®

## 64K-BIT READ-ONLY MEMORY MK36000(P/J/N)-4/5

### FEATURES

- MK36000 8K x 8 Organization—“Edge Activated” \* operation ( $\overline{CE}$ )
- Access Time/Cycle Time
 

P/N	Access	Cycle
MK36000-4	250ns	375ns
MK36000-5	300ns	450ns
- Single +5V  $\pm$  10% Power Supply
- Standard 24 pin DIP (EPROM Pin Out Compatible)

- Low Power Dissipation - 220mW Max Active
- Low Standby Power Dissipation—45mW Max. ( $\overline{CE}$  High)
- On chip latches for addresses
- Inputs and three-state outputs-TTL compatible
- Outputs drive 2 TTL loads and 100 pF

### DESCRIPTION

The MK36000 is a new generation N-channel silicon gate MOS Read Only Memory, organized as 8192 words by 8 bits. As a state-of-the-art device, the MK36000 incorporates advanced circuit techniques designed to provide maximum circuit density and reliability with the highest possible performance, while maintaining low power dissipation and wide operating margins.

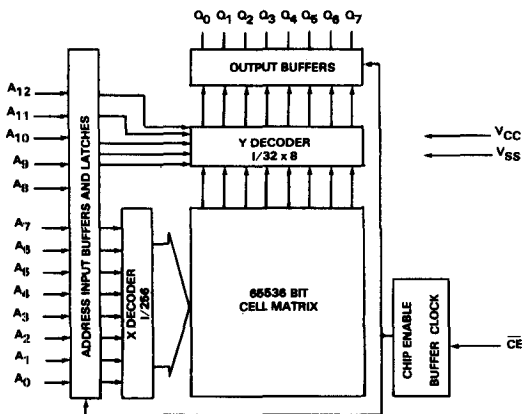
The MK36000 utilizes what is fast becoming an industry standard method of device operation. Use of a static storage cell with clocked control periphery allows the circuit to be put into an automatic low power standby mode. This is accomplished by maintaining the chip enable ( $\overline{CE}$ ) input at a TTL high level. In this mode, power dissipation is reduced to typically 45mW, as compared to unlocked devices which

draw full power continuously. In system operation, a device is selected by the  $\overline{CE}$  input, while all others are in a low power mode, reducing the overall system power. Lower power means reduced power supply cost, less heat to dissipate and an increase in device and system reliability.

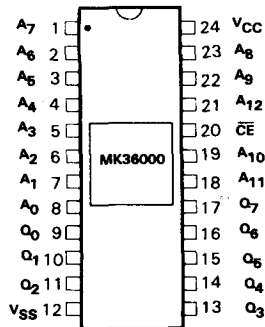
The edge activated chip enable also means greater system flexibility and an increase in system speed. The MK36000 features onboard address latches controlled by the  $\overline{CE}$  input. Once the address hold time specification has been met, new address data can be applied in anticipation of the next cycle. Outputs can be wire-‘OR’ed together, and a specific device can be selected by utilizing the  $\overline{CE}$  input with no bus conflict on the outputs. The  $\overline{CE}$  input allows the fastest access times yet available in 5 volt only

ROMS

### FUNCTIONAL DIAGRAM (MK36000)



### PIN CONNECTIONS



### PIN NAMES

A <sub>0</sub> -A <sub>12</sub>	Address	V <sub>SS</sub>	GND
Q <sub>0</sub> -Q <sub>7</sub>	Outputs	$\overline{CE}$	Chip Enable
V <sub>CC</sub>	+5V		

\* Trademark of Mostek Corporation

### ABSOLUTE MAXIMUM RATINGS\*

Voltage on Any Terminal Relative to $V_{SS}$ .....	-1.0V to +7V
Operating Temperature $T_A$ (Ambient) .....	0°C to +70°C
Storage Temperature - Ceramic (Ambient) .....	-65°C to +150°C
Storage Temperature - Plastic (Ambient) .....	-55°C to +125°C
Power Dissipation .....	1 Watt

\*Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operating sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

### RECOMMENDED DC OPERATING CONDITIONS<sup>6</sup> (0°C ≤ $T_A$ ≤ +70°C)

SYM	PARAMETER	MIN	TYP	MAX	UNITS	NOTES
$V_{CC}$	Power Supply Voltage	4.5	5.0	5.5	Volts	6
$V_{IL}$	Input Logic 0 Voltage	-1.0		0.8	Volts	
$V_{IH}$	Input Logic 1 Voltage	2.0		$V_{CC}$	Volts	

### DC ELECTRICAL CHARACTERISTICS ( $V_{CC} = 5V \pm 10%$ ) (0°C ≤ $T_A$ ≤ +70°C)<sup>6</sup>

SYM	PARAMETER	MIN	TYP	MAX	UNITS	NOTES
$I_{CC1}$	$V_{CC}$ Power Supply Current (Active)			40	mA	1
$I_{CC2}$	$V_{CC}$ Power Supply Current (Standby)			8	mA	7
$I_{I(L)}$	Input Leakage Current	-10		10	μA	2
$I_{O(L)}$	Output Leakage Current	-10		10	μA	3
$V_{OL}$	Output Logic "0" Voltage @ $I_{OUT} = 3.3mA$			0.4	volts	
$V_{OH}$	Output Logic "1" Voltage @ $I_{OUT} = -220 \mu A$	2.4			volts	

### AC ELECTRICAL CHARACTERISTICS ( $V_{CC} = 5V \pm 10%$ ) (0°C ≤ $T_A$ ≤ +70°C)<sup>6</sup>

SYM	PARAMETER	-4		-5		UNITS	NOTES
		MIN	MAX	MIN	MAX		
$t_C$	Cycle Time	375		450		ns	4
$t_{CE}$	$\overline{CE}$ Pulse Width	250	10000	300	10000	ns	4
$t_{AC}$	$\overline{CE}$ Access Time		250		300	ns	4
$t_{OFF}$	Output Turn Off Delay		60		75	ns	4
$t_{AH}$	Address Hold Time Referenced to $\overline{CE}$	60		75		ns	
$t_{AS}$	Address Setup Time Referenced to $\overline{CE}$	0		0		ns	
$t_p$	$\overline{CE}$ Precharge Time	125		150		ns	

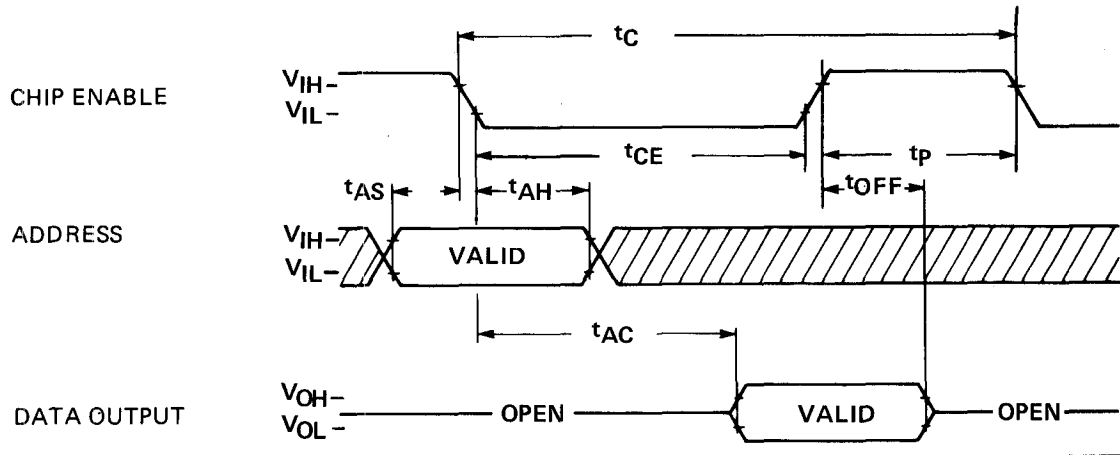
#### NOTES:

- Current is proportional to cycle rate.  $I_{CC1}$  is measured at the specified minimum cycle time. Data Outputs open.
- $V_{IN} = 0V$  to 5.5V ( $V_i = 5V$ )
- Device unselected;  $V_{OUT} = 0V$  to 5.5V
- Measured with 2 TTL loads and 100pF, transition times = 20ns
- Capacitance measured with Boonton Meter or effective capacitance calculated from the equation:  
 $C = \frac{\Delta Q}{\Delta V}$  with  $\Delta V = 3$  volts
- A minimum 2msec time delay is required after the application of  $V_{CC} (+5)$  before proper device operation is achieved.  $\overline{CE}$  must be at  $V_{IH}$  for this time period.
- $\overline{CE}$  high.

**CAPACITANCE**  
( $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$ )

SYM	PARAMETER	TYP	MAX	UNITS	NOTES
$C_i$	Input Capacitance	5	8	pF	5
$C_o$	Output Capacitance	7	15	pF	5

**TIMING DIAGRAM**



ROMS

**DESCRIPTION (Continued)**

ROM's and imposes no loss in system operating flexibility over an unlocked device.

Other system oriented features include fully TTL compatible inputs and outputs. The three state outputs, controlled by the  $\overline{CE}$  input, will drive a minimum of 2 standard TTL loads. The MK36000 operates from a single +5 volt power supply with a wide  $\pm 10\%$  tolerance, providing the widest operating margins available. The MK36000 is packaged in the industry standard 24 pin DIP.

Any application requiring a high performance, high bit density ROM can be satisfied by the MK36000 ROM. This device is ideally suited for 8 bit micro-processor systems such as those which utilize the Z-80. It can offer significant cost advantages over PROM.

**OPERATION**

The MK36000 is controlled by the chip enable ( $\overline{CE}$ ) input. A negative going edge at the  $\overline{CE}$  input will

activate the device as well as strobe and latch the inputs into the onchip address registers. At access time the outputs will become active and contain the data read from the selected location. The outputs will remain latched and active until  $\overline{CE}$  is returned to the inactive state.

**Programming Data**

MOSTEK is now able to utilize a wide spectrum of data input formats and media. Those presently available are listed in the following table: