



## 27010 1M (128K x 8) BYTE-WIDE EPROM

- **Compatible with 28-Pin JEDEC EPROMs: 27256, 27512**
- **Complete Upgrade Capability**
  - PGM "Don't Care" Status Allows Wiring in Higher Order Addresses
- **Standard EPROM Features**
  - TTL Compatibility
  - Two Line Control
  - **intelligent Identifier™** for Automated Programming
- **Fast Programming**
  - **Quick-Pulse Programming™** Algorithm
  - Programming Time as fast as 15 seconds
- **High-Performance HMOS\* II-E**
  - 200 ns Access Time
  - Low 150 mA Active Power
- **Compact Packaging**
  - **Smallest Standard-Addressed Footprint**
  - 32-Pin Cerdip

The Intel 27010 is a 5V-only, 1,048,576-bit Erasable Programmable Read Only Memory. It is organized as 128 K-words of 8 bits each. Its pin-compatibility with byte-wide JEDEC EPROMs allows upgrades from 16K through 512K EPROMs. In addition, unique circuit designs provide for no-hardware-change upgrades to 8M-bits in the future.

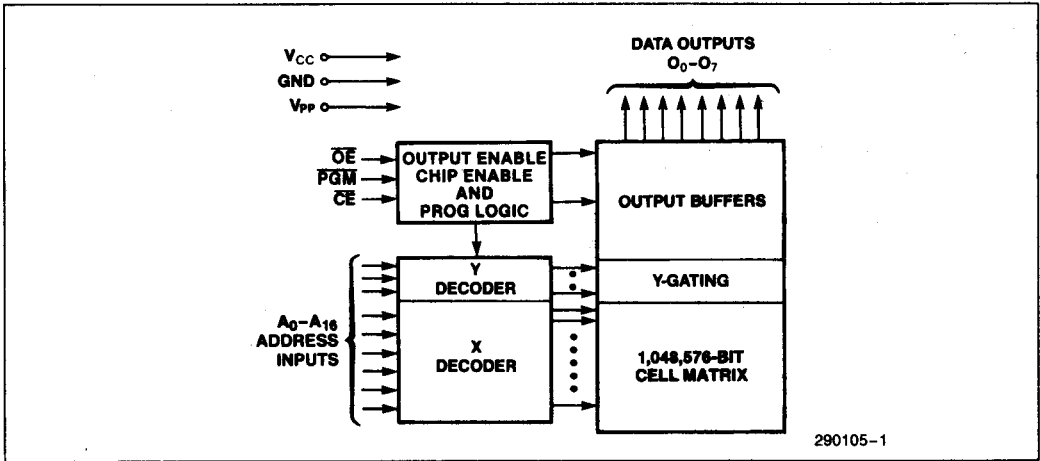
When a 32-pin DIP socket is configured for 27256 or 27512 EPROMs, it is easily upgraded for the 27010. By adding an A16 address line and V<sub>CC</sub> jumper, the 27010 can directly replace lower density 28-pin EPROMs. Upgrades through 8M-bits are easily accommodated. Since the PGM pin is in a "don't care" state during read mode, direct connections to higher order addresses, A17 and A18, can be made without affecting the device's read operation.

The 27010 provides the highest capacity available to microprocessors with 8-bit bus organizations for storage of large portions of operating system and application software. Its 200 ns access time provides no-WAIT-state operation with high-performance CPUs such as the 10 MHz 80188. The 27010 offers a minimal chip solution for code storage needs of 100% firmware-based equipment. And for reprogrammable systems, popular application programs can be made much more "user friendly." Often-used software is silently and quickly executed from reliable EPROM storage, greatly enhancing system utility. When two or more EPROM sockets are used in 16-bit or 32-bit systems, the compact 32-pin DIP package requires the smallest board space of any high density memory without utilizing paged or multiplexed addressing schemes.

The 27010 shares several features with standard JEDEC EPROMs, including two-line output control for simplified interfacing and the intelligent Identifier™ feature for automated programming. It can also be programmed quickly using Intel's Quick-Pulse Programming™ Algorithm.

The 27010 is manufactured using an advanced version of Intel's HMOS\* II-E process which assures highest reliability and manufacturability.

\*HMOS is a patented process of Intel Corporation.



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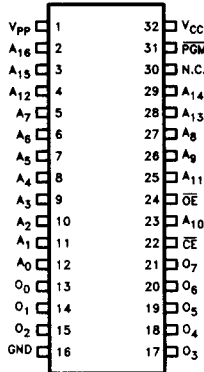
Figure 1. Block Diagram

Pin Names

A <sub>0</sub> -A <sub>19</sub>	ADDRESSES
CE	CHIP ENABLE
OE	OUTPUT ENABLE
O <sub>0</sub> -O <sub>7</sub>	OUTPUTS
PGM	PROGRAM
N.C.	NO INTERNAL CONNECT

8Mbit	4Mbit	2Mbit	27512 27C512	27256 27C256
A <sub>19</sub>	V <sub>PP</sub>	V <sub>PP</sub>		V <sub>PP</sub>
A <sub>18</sub>	A <sub>18</sub>	A <sub>18</sub>		A <sub>12</sub>
A <sub>15</sub>	A <sub>15</sub>	A <sub>15</sub>	A <sub>15</sub>	
A <sub>12</sub>	A <sub>12</sub>	A <sub>12</sub>	A <sub>12</sub>	
A <sub>7</sub>	A <sub>7</sub>	A <sub>7</sub>	A <sub>7</sub>	A <sub>7</sub>
A <sub>6</sub>	A <sub>6</sub>	A <sub>6</sub>	A <sub>6</sub>	A <sub>6</sub>
A <sub>5</sub>	A <sub>5</sub>	A <sub>5</sub>	A <sub>5</sub>	A <sub>5</sub>
A <sub>4</sub>	A <sub>4</sub>	A <sub>4</sub>	A <sub>4</sub>	A <sub>4</sub>
A <sub>3</sub>	A <sub>3</sub>	A <sub>3</sub>	A <sub>3</sub>	A <sub>3</sub>
A <sub>2</sub>	A <sub>2</sub>	A <sub>2</sub>	A <sub>2</sub>	A <sub>2</sub>
A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>	A <sub>1</sub>
A <sub>0</sub>	A <sub>0</sub>	A <sub>0</sub>	A <sub>0</sub>	A <sub>0</sub>
O <sub>0</sub>	O <sub>0</sub>	O <sub>0</sub>	O <sub>0</sub>	O <sub>0</sub>
O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>	O <sub>1</sub>
O <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>	O <sub>2</sub>
GND	GND	GND	GND	GND

27010/27C010



27256 27C256	27512 27C512	2Mbit	4Mbit	8Mbit
V <sub>CC</sub>	V <sub>CC</sub>	V <sub>CC</sub>	V <sub>CC</sub>	V <sub>CC</sub>
A <sub>14</sub>	A <sub>14</sub>	A <sub>17</sub>	A <sub>18</sub>	A <sub>18</sub>
A <sub>13</sub>	A <sub>13</sub>	A <sub>14</sub>	A <sub>17</sub>	A <sub>17</sub>
A <sub>8</sub>	A <sub>8</sub>	A <sub>13</sub>	A <sub>14</sub>	A <sub>14</sub>
A <sub>9</sub>	A <sub>9</sub>	A <sub>8</sub>	A <sub>13</sub>	A <sub>13</sub>
A <sub>11</sub>	A <sub>11</sub>	A <sub>9</sub>	A <sub>8</sub>	A <sub>8</sub>
OE	OE/V <sub>PP</sub>	A <sub>11</sub>	A <sub>9</sub>	A <sub>9</sub>
A <sub>10</sub>	A <sub>10</sub>	OE	A <sub>11</sub>	A <sub>11</sub>
CE	CE	OE	OE	OE/V <sub>PP</sub>
O <sub>7</sub>	O <sub>7</sub>	A <sub>10</sub>	A <sub>10</sub>	A <sub>10</sub>
O <sub>6</sub>	O <sub>6</sub>	CE	CE	CE
O <sub>5</sub>	O <sub>5</sub>	O <sub>7</sub>	O <sub>7</sub>	O <sub>7</sub>
O <sub>4</sub>	O <sub>4</sub>	O <sub>6</sub>	O <sub>6</sub>	O <sub>6</sub>
O <sub>3</sub>	O <sub>3</sub>	O <sub>5</sub>	O <sub>5</sub>	O <sub>5</sub>
		O <sub>4</sub>	O <sub>4</sub>	O <sub>4</sub>
		O <sub>3</sub>	O <sub>3</sub>	O <sub>3</sub>

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Figure 2. Cerdip DIP Pin Configurations

## EXTENDED TEMPERATURE (EXPRESS) EPROMs

The Intel EXPRESS EPROM family is a series of electrically programmable read only memories which have received additional processing to enhance product characteristics. EXPRESS processing is available for several densities of EPROM, allowing the choice of appropriate memory size to match system applications. EXPRESS EPROM products are

available with 168 ±8 hour, 125°C dynamic burn-in using Intel's standard bias configuration. This process exceeds or meets most industry specifications of burn-in. The standard EXPRESS EPROM operating temperature range is 0°C to 70°C. Extended operating temperature range (-40°C to +85°C) EXPRESS products are available. Like all Intel EPROMs, the EXPRESS EPROM family is inspected to 0.1% electrical AQL. This may allow the user to reduce or eliminate incoming inspection testing.

## EXPRESS EPROM PRODUCT FAMILY

### PRODUCT DEFINITIONS

Type	Operating Temperature	Burn-in 125°C (hr)
Q	0°C to +70°C	168 ±8
T	-40°C to +85°C	None
L	-40°C to +85°C	168 ±8

## EXPRESS OPTIONS

### 27010 VERSIONS

Packaging Options	
Speed Versions	Cerdip
-200V05	Q, T, L

## READ OPERATION

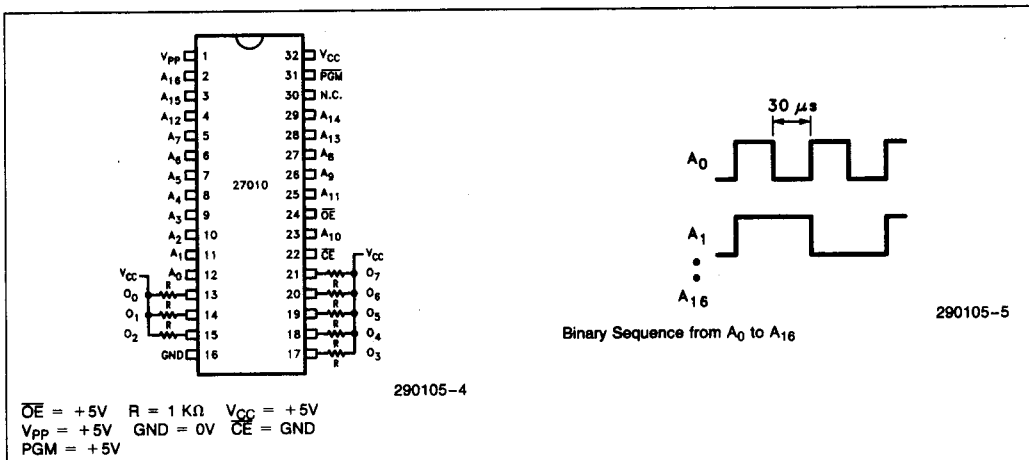
### D.C. CHARACTERISTICS

Electrical parameters of EXPRESS EPROM products are identical to standard EPROM parameters except for:

Symbol	Parameter	TD27010 LD27010		Test Conditions
		Min	Max	
$I_{CC1}^{(1)}$	$V_{CC}$ Active Current (mA)		160	$\overline{OE} = \overline{CE} = V_{IL}$ , $T_{Ambient} = -40^\circ C$
	$V_{CC}$ Active Current at High Temperature (mA)		125	$\overline{OE} = \overline{CE} = V_{IL}$ $V_{PP} = V_{CC}$ , $T_{Ambient} = 85^\circ C$

### NOTE:

1. The maximum current value is with outputs  $O_0$  to  $O_7$  unloaded.



Burn-In Bias and Timing Diagrams