Features

- **Fast Read Access Time - 70 ns**
- **Automatic Page Write Operation**
  Internal Address and Data Latches for 64 Bytes
  Internal Control Timer
- **Fast Write Cycle Times**
  Page Write Cycle Time: 10 ms or 3 ms maximum
  1 to 64 Byte Page Write Operation
- **Low Power Dissipation**
  80 mA Active Current
  3 mA Standby Current (AT28HC256L)
- **Hardware and Software Data Protection**
- **$\overline{\text{DATA}}$ Polling for End of Write Detection**
- **High Reliability CMOS Technology**
  Endurance: 10^4 or 10^5 Cycles
  Data Retention: 10 years
- **Single 5 V ± 10% Supply**
- **CMOS and TTL Compatible Inputs and Outputs**
- **JEDEC Approved Byte-Wide Pinout**
- **Full Military, Commercial, and Industrial Temperature Ranges**

256K (32K x 8) High Speed CMOS E²PROM

Description

The AT28HC256/L is a high-performance Electrically Erasable and Programmable Read Only Memory. Its 256K of memory is organized as 32,768 words by 8 bits. Manufactured with Atmel's advanced nonvolatile CMOS technology, the AT28HC256 offers access times to 70 ns with power dissipation of just 440 mW. When the AT28HC256/L is deselected, the standby current is less than 5 mA.

The AT28HC256/L is accessed like a Static RAM for the read or write cycle without the need for external components. The device contains a 64-byte page register to allow writing of up to 64 bytes simultaneously. During a write cycle, the address and 1 to 64 bytes of data are internally latched, freeing the addresses and data bus for other operations. Following the initiation of a write cycle, the device will automatically write the latched data using an internal control timer. The end of a write cycle can be detected by $\overline{\text{DATA}}$ polling of I/O7. Once the end of a write cycle has been detected a new access for a read or write can begin.
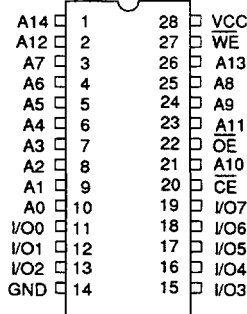
Atmel's 28HC256/L has additional features to ensure high quality and manufacturability. The device utilizes internal error correction for extended endurance and improved data retention characteristics. An optional software data protection mechanism is available to guard against inadvertent writes. The device also includes an extra 64 bytes of E²PROM for device identification or tracking.
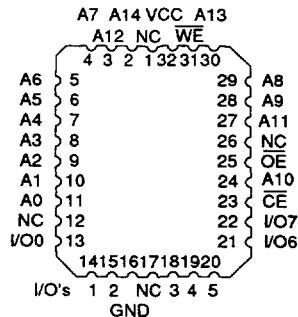
Pin Configurations

Pin Name	Function
A0 - A14	Addresses
$\overline{CE}$	Chip Enable
$\overline{OE}$	Output Enable
$\overline{WE}$	Write Enable
I/O0 - I/O7	Data Inputs/Outputs
NC	No Connect

28D, 28F, 28P, 28S

```
A14 ⊏ 1       28 ⊐ VCC
A12 ⊏ 2       27 ⊐ WE
A7  ⊏ 3       26 ⊐ A13
A6  ⊏ 4       25 ⊐ A8
A5  ⊏ 5       24 ⊐ A9
A4  ⊏ 6       23 ⊐ A11
A3  ⊏ 7       22 ⊐ OE
A2  ⊏ 8       21 ⊐ A10
A1  ⊏ 9       20 ⊐ CE
A0  ⊏ 10      19 ⊐ I/O7
I/O0 ⊏ 11     18 ⊐ I/O6
I/O1 ⊏ 12     17 ⊐ I/O5
I/O2 ⊏ 13     16 ⊐ I/O4
GND ⊏ 14      15 ⊐ I/O3
```

32J, 32L

```
           A7 A14 VCC A13
             A12 NC WE
          4 3 2 1 32 31 30
A6  ⟩ 5              29 ⟨ A8
A5  ⟩ 6              28 ⟨ A9
A4  ⟩ 7              27 ⟨ A11
A3  ⟩ 8              26 ⟨ NC
A2  ⟩ 9              25 ⟨ OE
A1  ⟩ 10             24 ⟨ A10
A0  ⟩ 11             23 ⟨ CE
NC  ⟩ 12             22 ⟨ I/O7
I/O0 ⟩ 13            21 ⟨ I/O6
       14 15 16 17 18 19 20
I/O's  1 2 NC 3 4 5
            GND
```

Note: PLCC package pins 1 and 17 are DON'T CONNECT.

28U
TOPVIEW

4 A6	3 A7	1 A14	27 WE	26 A13
5 A5	2 A12	28 VCC	24 A9	25 A8
7 A3	6 A4		22 OE	23 A11
9 A1	8 A2		20 CE	21 A10
11 I/O0	10 A0	14 GND	16 I/O4	19 I/O7
12 I/O1	13 I/O2	15 I/O3	17 I/O5	18 I/O6

28T

```
OE  ⊏       1            28  A10
A11 ⊏   2          27         CE
A9  ⊏       3       26   I/O7
A8  ⊏   4          25         I/O6
A13 ⊏       5       24   I/O5
WE  ⊏   6          23         I/O4
VCC ⊏       7       22   I/O3
A14 ⊏   8          21         GND
A12 ⊏       9       20   I/O2
A7  ⊏   10         19         I/O1
A6  ⊏       11      18   I/O0
A5  ⊏   12         17         A0
A4  ⊏       13      16   A1
A3  ⊏   14               15   A2
```
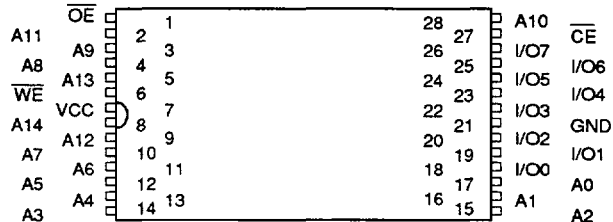
Product Selection Guide

AT28HC256

Part Number	Option	Speed	Package								Temp Range	Access Time	Operating Temperature Range	Availability
			D	F	J	L	P	S	T	U				
AT28HC256	E,F	-70	•		•		•			•	C	70ns	0°C to +70°C	NOW
AT28HC256	E,F	-70	•		•		•			•	I	70ns	-40°C to +85°C	NOW
AT28HC256	E,F	-90	•		•		•			•	C	90ns	0°C to +70°C	NOW
AT28HC256	E,F	-90	•		•		•			•	I	90ns	-40°C to +85°C	NOW
AT28HC256	E,F	-90	•	•		•				•	M/883	90ns	-55°C to +125°C	NOW
AT28HC256	E,F	-12	•		•		•	•	•	•	C	120ns	0°C to +70°C	NOW
AT28HC256	E,F	-12	•		•		•	•	•	•	I	120ns	-40°C to +85°C	NOW
AT28HC256	E,F	-12	•	•		•				•	M/883	120ns	-55°C to +125°C	NOW
SMD Numbers for AT28HC256														
5962-8863403			•	•		•				•	M/883	90ns	-55°C to +125°C	NOW
5962-8863404	F		•	•		•				•	M/883	90ns	-55°C to +125°C	NOW

Package descriptions on page 33.

AT28HC256/L

AT28HC256L

Part Number	Option	Speed	Package							Temp Range	Access Time	Operating Temperature Range	Availability
			D	F	J	L	P	U	W				
AT28HC256L	E,F	-90	•		•		•	•		C	90ns	0°C to +70°C	NOW
AT28HC256L	E,F	-90	•		•		•	•		I	90ns	-40°C to +85°C	NOW
AT28HC256L	E,F	-12	•		•		•	•	•	C	120ns	0°C to +70°C	NOW
AT28HC256L	E,F	-12	•		•		•	•		I	120ns	-40°C to +85°C	NOW
AT28HC256L	E,F	-12	•	•		•		•		M/883	120ns	-55°C to +125°C	NOW
SMD Number For AT28HC256L													
5962-8863401			•	•	•	•	•	•		M/883	120ns	-55°C to +125°C	NOW
5962-8863402	F		•	•		•		•		M/883	120ns	-55°C to +125°C	NOW

Package descriptions on page 33.