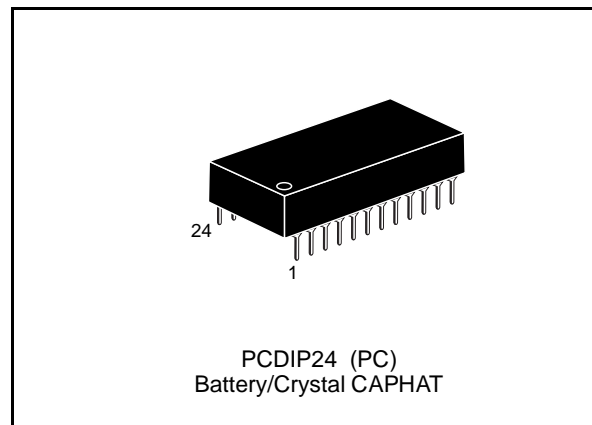**M48T02**
M48T12

16 Kbit (2Kb x8)TIMEKEEPER® SRAM

- INTEGRATED ULTRA LOW POWER SRAM, REAL TIME CLOCK and POWER-FAIL CONTROL CIRCUIT
- BYTEWIDE™ RAM-LIKE CLOCK ACCESS
- BCD CODED YEAR, MONTH, DAY, DATE, HOURS, MINUTES and SECONDS
- TYPICAL CLOCK ACCURACY of $\pm$ 1 MINUTE a MONTH, @ 25°C
- SOFTWARE CONTROLLED CLOCK CALIBRATION for HIGH ACCURACY APPLICATIONS
- AUTOMATIC POWER-FAIL CHIP DESELECT and WRITE PROTECTION
- WRITE PROTECT VOLTAGES (V_{PFD} = Power-fail Deselect Voltage):
  – M48T02: 4.5V $\leq$ V_{PFD} $\leq$ 4.75V
  – M48T12: 4.2V $\leq$ V_{PFD} $\leq$ 4.5V
- SELF-CONTAINED BATTERY and CRYSTAL in the CAPHAT DIP PACKAGE
- PIN and FUNCTION COMPATIBLE with JEDEC STANDARD 2Kb x8 SRAMs

PCDIP24 (PC)
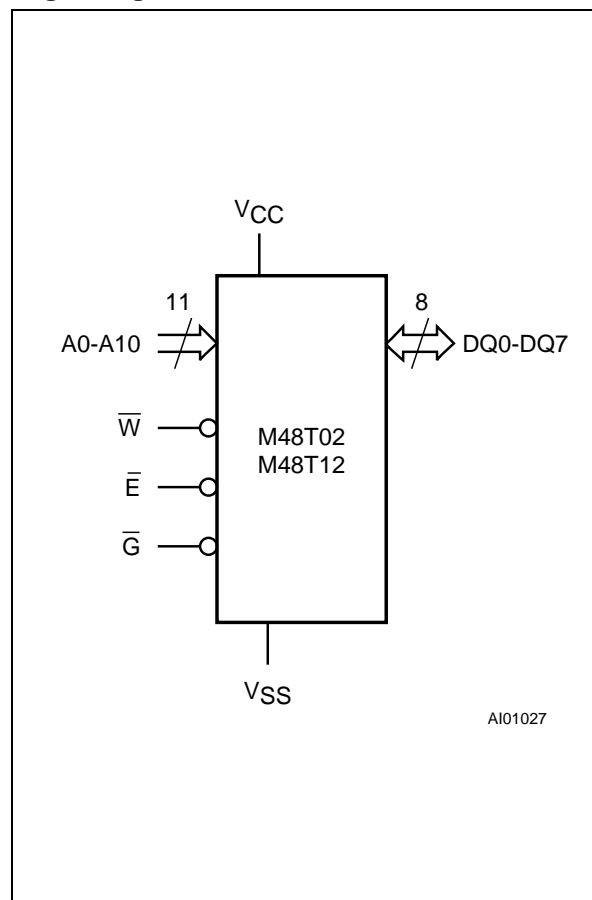Battery/Crystal CAPHAT

Logic Diagram

DESCRIPTION

The M48T02/12 TIMEKEEPER® RAM is a 2Kb x8 non-volatile static RAM and real time clock which is pin and functional compatible with the DS1642. A special 24 pin 600mil DIP CAPHAT™ package houses the M48T02/12 silicon with a quartz crystal and a long life lithium button cell to form a highly integrated battery backed-up memory and real time clock solution.

The M48T02/12 button cell has sufficient capacity and storage life to maintain data and clock function-ality for an accumulated time period of at least 10 years in the absence of power over the operating temperature range.

The M48T02/12 is a non-volatile pin and function equivalent to any JEDEC standard 2Kb x8 SRAM. It also easily fits into many ROM, EPROM, and EEPROM sockets, providing the non-volatility of PROMs without any requirement for special write timing or limitations on the number of writes that can be performed.
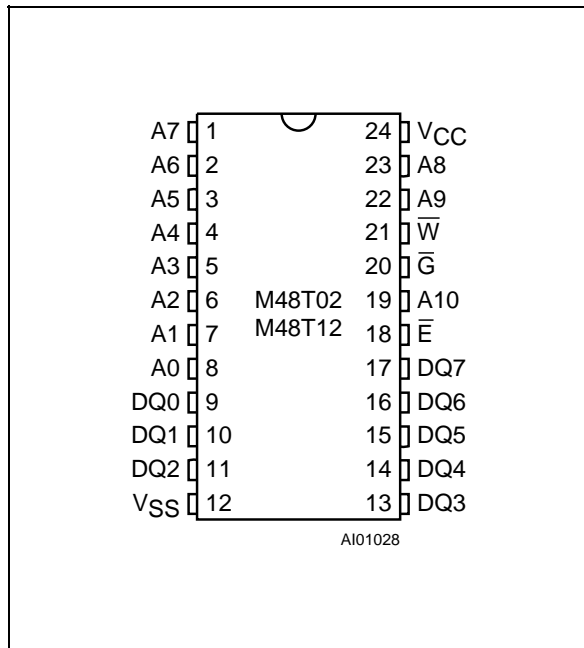
DIP Pin Connections

```
        ┌─────────┐
  A7 ▯ 1     24 ▯ V_CC
  A6 ▯ 2     23 ▯ A8
  A5 ▯ 3     22 ▯ A9
  A4 ▯ 4     21 ▯ W̄
  A3 ▯ 5     20 ▯ Ḡ
  A2 ▯ 6  M48T02  19 ▯ A10
  A1 ▯ 7  M48T12  18 ▯ Ē
  A0 ▯ 8     17 ▯ DQ7
 DQ0 ▯ 9     16 ▯ DQ6
 DQ1 ▯ 10    15 ▯ DQ5
 DQ2 ▯ 11    14 ▯ DQ4
 V_SS ▯ 12   13 ▯ DQ3
        └─────────┘
          AI01028
```

Signal Names

A0-A10	Address Inputs
DQ0-DQ7	Data Inputs / Outputs
$\overline{E}$	Chip Enable
$\overline{G}$	Output Enable
$\overline{W}$	Write Enable
V_{CC}	Supply Voltage
V_{SS}	Ground

Ordering Information Scheme

For a list of available options or for further information on any aspect of this device, please contact the STMicroelectronics Sales Office nearest to you.

Example: M48T02   -70 PC 1

Supply Voltage and Write Protect Voltage
02 V_{CC} = 4.75V to 5.5V V_{PFD} = 4.5V to 4.75V
12 V_{CC} = 4.5V to 5.5V V_{PFD} = 4.2V to 4.5V

Speed	
-70	70ns
-150	150ns
-200	200ns

Package
PC PCDIP24

Temperature Range
1   0 to 70 °C