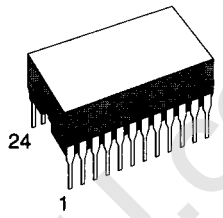
SGS-THOMSON MICROELECTRONICS

MK48T87A

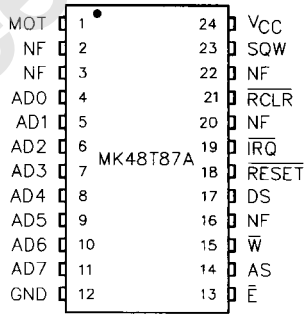
CMOS 64 X 8 ADDRESS/DATA MULTIPLEXED TIMEKEEPER SRAM

- DROP-IN REPLACEMENT FOR PC AT COMPUTER CLOCK/CALENDAR
- TOTALLY NONVOLATILE WITH 10 YEARS OF OPERATION IN THE ABSENCE OF POWER
- SELF-CONTAINED SUBSYSTEM INCLUDES LITHIUM BATTERY, QUARTZ CRYSTAL AND SUPPORT CIRCUITRY
- COUNTS SECONDS, MINUTES, HOURS, DAYS, DAY OF THE WEEK, DATE, MONTH AND YEAR WITH LEAP YEAR COMPENSATION
- BINARY OR BCD REPRESENTATION OF TIME, CALENDAR AND ALARM
- 12 OR 24 HOUR CLOCK WITH AM AND PM IN 12 HOUR MODE
- SELECTABLE BUS TIMING
- MULTIPLEX BUS FOR PIN EFFICIENCY
- INTERFACED WITH SOFTWARE AS 64 RAM LOCATIONS:
  - 14 Bytes Of Clock And Control Registers
  - 50 Bytes Of General Purpose RAM
- PROGRAMMABLE SQUARE WAVE OUTPUT SIGNAL
- BUS COMPATIBLE INTERRUPT SIGNALS (IRQ)
- THREE INTERRUPTS ARE SEPARATELY SOFTWARE-MASKABLE AND TESTABLE:
  - Time-of-day Alarm Once/Second To Once/Day
  - Periodic Rates From 122 µs To 500 ms
  - End Of Clock Update Cycle



PHDIP24 WITH BATTERY TOP HAT (B)

Figure 1. Pin Connection



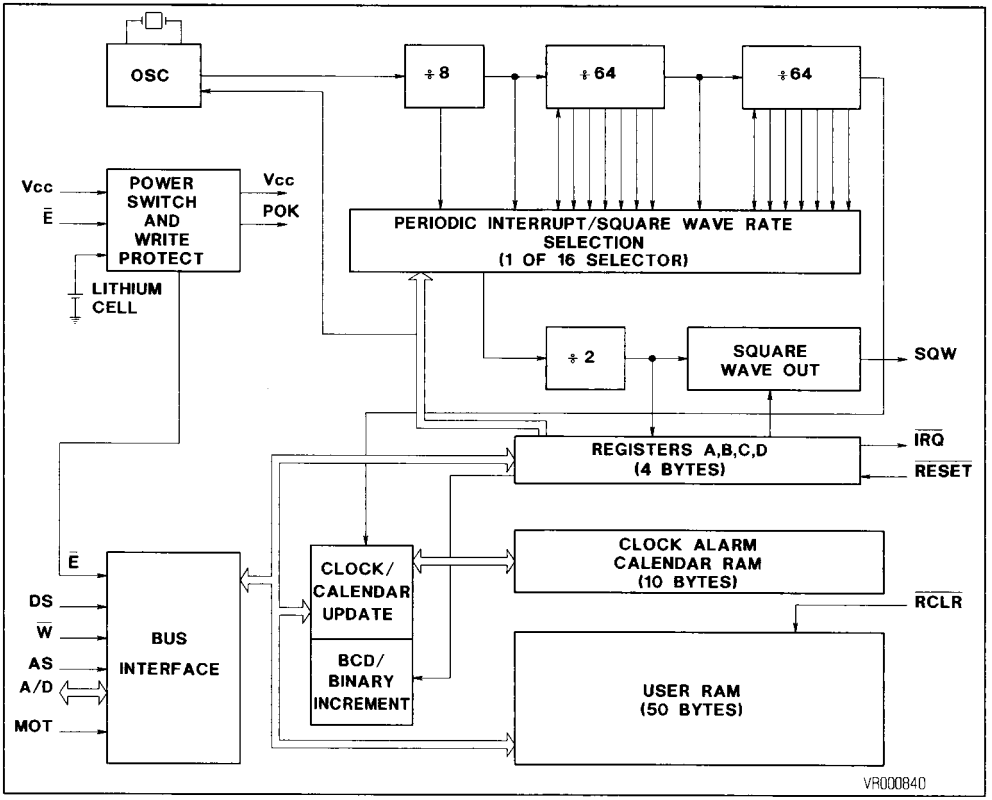
PIN NAMES

AD0 -AD7	Address / Data
Vcc/GND	5 Volts/Ground
$\overline{E}$	Chip Select
AS	Address Strobe
$\overline{W}$	Read/Write
SQW	Square Wave Out
MOT	Bus Type Selection

$\overline{IRQ}$	Interrupt Request
$\overline{RESET}$	Reset
DS	Data Strobe
$\overline{RCLR}$	RAM Clear
NF	No Function

NF pin serves no function and may be connected to other signals within Absolute Maximum Ratings, without affecting device operation. The electrical characteristics are the same as the other inputs pins.

Figure 2. Block Diagram



DESCRIPTION

The MK48T87A TIMEKEEPER™ RAM is designed to be a compatible replacement for the MC146818 and the DS1287A. A lithium energy source, a quartz crystal and write-protection circuitry are contained within a 24-pin dual in-line package. The MK48T87A is, therefore, a complete subsystem replacing as many as 16 components in a typical application. The functions available to the user include a nonvolatile time-of-day clock, an alarm, a one-hundred-year calendar, programmable interrupt, square wave generator, and 50 bytes of nonvolatile static RAM. The Real Time Clock/RAM is unique in that the time-of-day and memory are maintained even in the absence of power.

Automatic deselection of the device provides insurance that data integrity is not compromised should V_{CC} fall below specified (V_{PFD}) levels. The automatic deselection of the device remains in effect upon power up for a period of 100ms after V_{CC} rises above V_{PFD}, provided the Real Time Clock is running and the count down chain is not in reset, allowing sufficient time for V_{CC} to stabilize and giving the system clock a wake up period so that a valid system reset can be established.

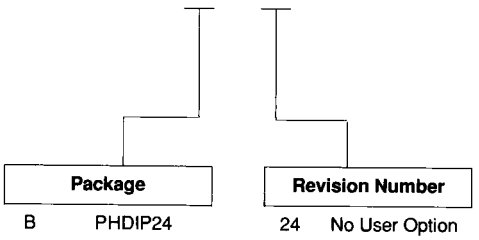
The block diagram in Figure 2 shows the pin connection with the major internal functions of MK48T87A (Real Time Clock/RAM). For a complete description of operating conditions, electrical characteristics, bus timing, and pin descriptions other than RCLR, see the MK48T87 datasheet.

SIGNAL DESCRIPTION

RCLR - The $\overline{RCLR}$ pin is used to clear (set to logic "1") all 50 bytes of general purpose RAM but does not affect the RAM associated with the Real Time Clock. In order to clear the RAM, $\overline{RCLR}$ must be forced to an input Logic "0" (-0.3 to 0.8 volts) for a minimun of 100 ms when V_{CC} is applied.

ORDERING INFORMATION

Example: MK48T87A B 24



For a list of available options refer to the Selector Guide in this Data Book or the current Memory Shortform that will be periodically up-dated.

For further information or any aspect of this device, please contact our Sales Office nearest to you.