

Description:

The 1362/1374 series modules are complete real time clocks (RTC) based on the NXP PCF8563 IC. Drawing less than 700nA from its on board lithium manganese coin cell, the RTC can maintain accurate time keeping for over 200 days on a single charge which requires only ten minutes when connected to external power. Each unit is trimmed for better than 2ppm accuracy (25C).

The RTC data interface is a standard I²C bus operating at 100kbps; refer to the NXP datasheet for the protocol and register configuration. The RTC/Slave side of the interface operates at 3V, the same voltage used to charge the back up battery, while the User/Master side can operate from 3V to 5.5V using the on board level shifter which includes the Master side bus pull up resistors. The PCF8563 includes two open drain outputs which can be connected to the user processor with pull up resistors to the processor V_{dd} power supply: /INT and CLKOUT.

The seconds, minutes, hours, days, weekdays, months, years as well as the minute alarm, hour alarm, day alarm and weekday alarm registers are all coded in Binary Coded Decimal (BCD) format. When the RTC registers are read the contents of all counters are frozen which prevents faulty reading of the clock/calendar during time counter carry operations. The PCF8563 compensates for leap years by adding a 29th day to February if the year counter contains a value which is exactly divisible by 4, including the year 00.

The PCF8563 has an on-chip voltage-low detector: When V_{DD} drops below V_{low}, bit VL in the seconds register is set to indicate that the integrity of the clock information is no longer guaranteed. The VL flag can only be cleared by software. Bit VL is intended to detect the situation when V_{DD} is decreasing slowly, for example under battery operation. Should V_{DD} reach V_{low} before power is re-asserted then bit VL is set. This will indicate that the time may be corrupted. When connected to a SmartNixie clock controller, if this condition is detected the bit is cleared and the time is set to 01/01/2008, 12:00:00 PM.

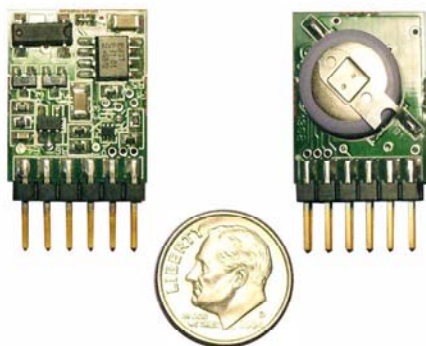


Fig 1. 1362 Vertical RTC

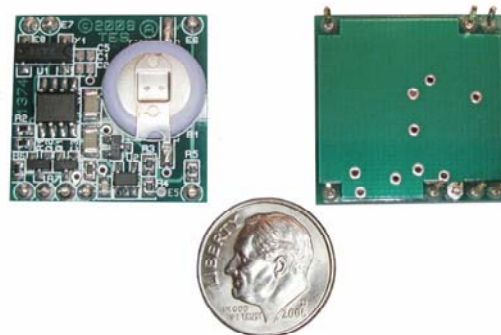


Fig 2. 1374 Horizontal RTC

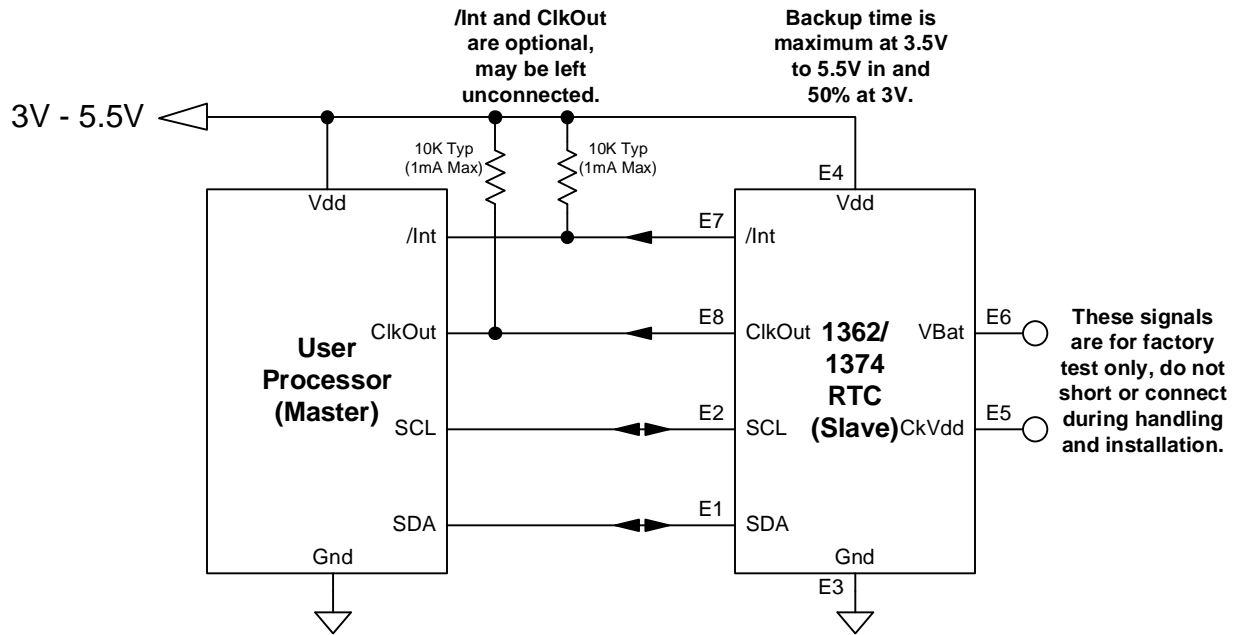


Fig 3. Typical application circuit (1374 pin numbering shown)

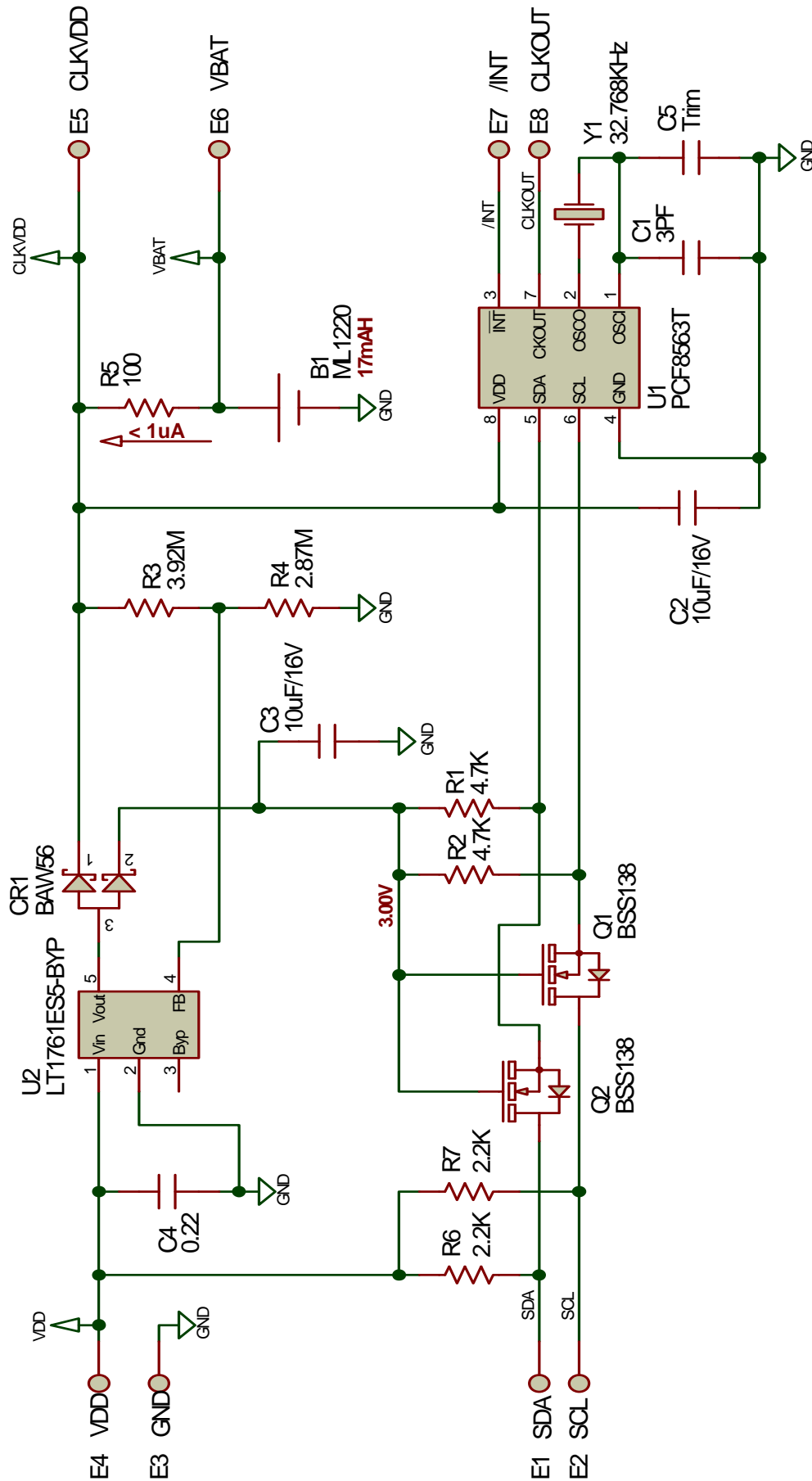


Fig 4. 1374 module schematic (1362 is the same circuit terminated to a 12 pin connector)

Recommended Layout
(Vertical mounting)

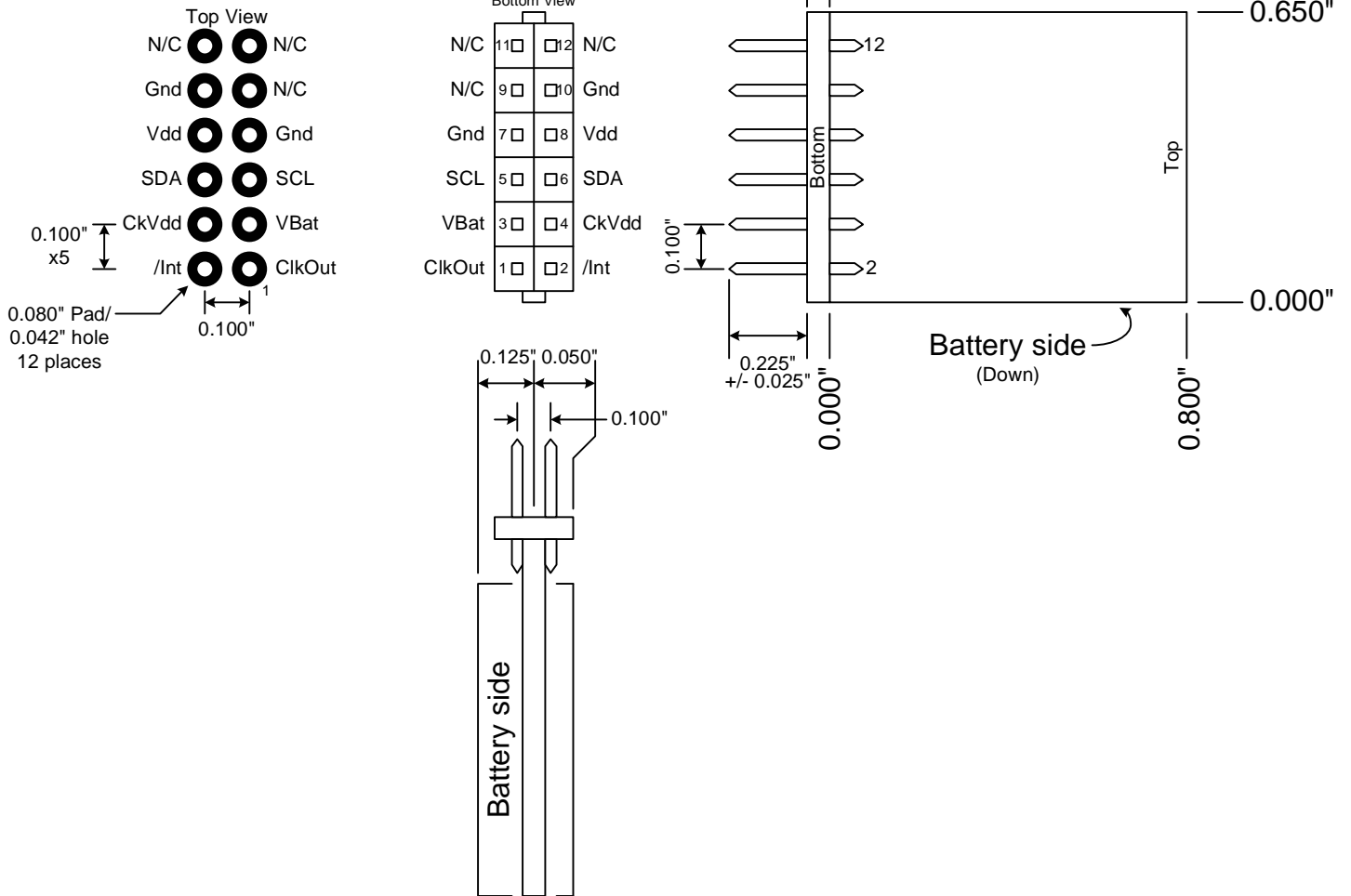


Fig 5. 1362 module outline and recommended PCB layout

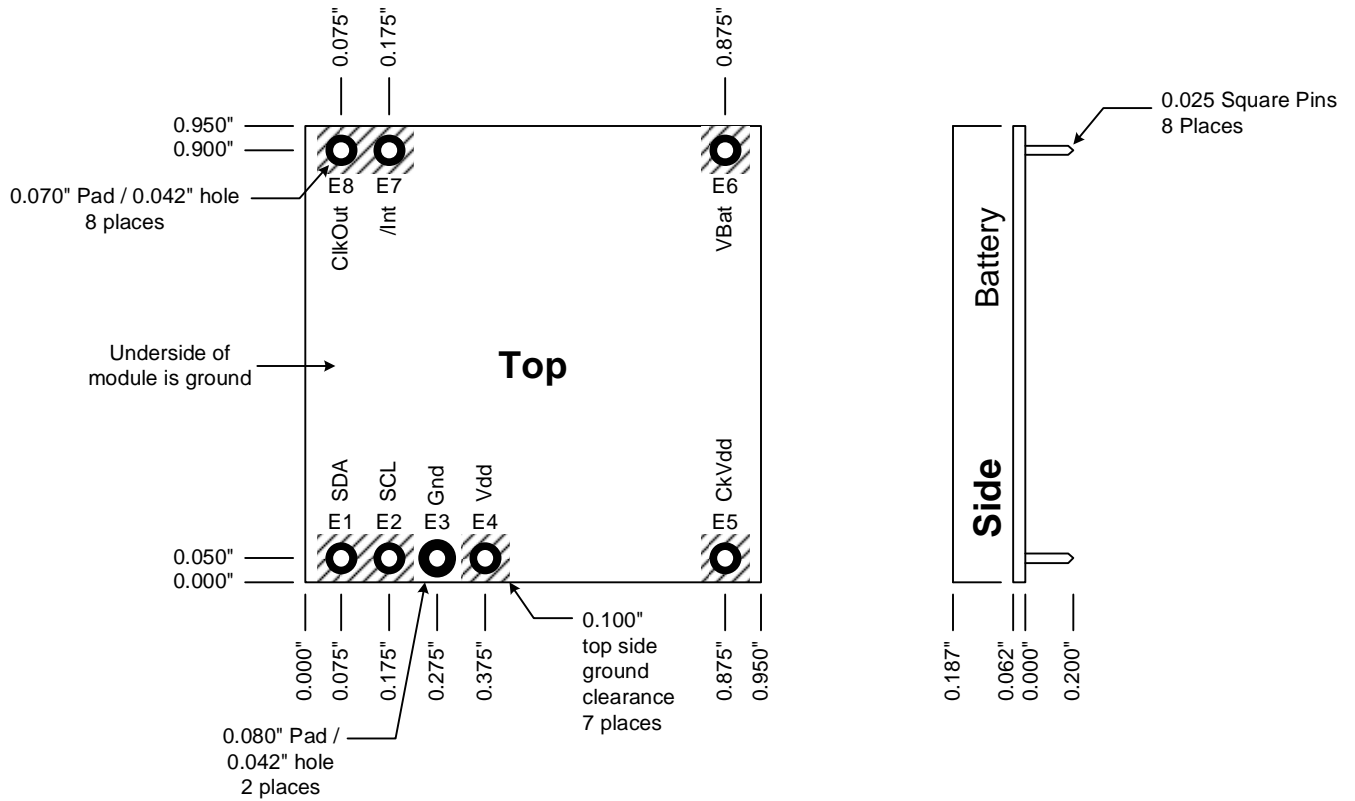


Fig 6. 1374 module outline and recommended PCB layout