



BENCHMARQ Using RAM Clear Function With bq3285/bq3287A RTCs

Introduction

The RAM clear function is useful for resetting data in battery-backed CMOS RAM. This function can, however, be detrimental when inadvertently activated. When activated, the RAM clear function on the bq3285 and bq3287A RTCs sets the contents of the 114 (or 242) bytes of CMOS RAM to "FF" (hex).

Figure 1 shows the circuit configuration required to use the RAM clear function. The Benchmarq RTC uses the on-chip time-base oscillator to de-bounce the momentary switch, SW1, over a period of 100 ms. This requires that the time-base oscillator and the divider chain must be turned on by writing a 02 (hex) in bit locations OSC2-OSC0 of register A. Although Figure 1 shows a momentary switch, an electronic signal can also be used with the same considerations.

All CMOS RAM locations are "cleared" when the Benchmarq RTC senses a low-level pulse of at least 100ms on the RAM clear pin, RCL, when $V_{CC} = 5V$.

Clearing RAM

Follow these steps to clear RAM using the Benchmarq and Dallas Semiconductor RTCs:

1. Turn on the oscillator (this is a normal part of initialization when power is on).

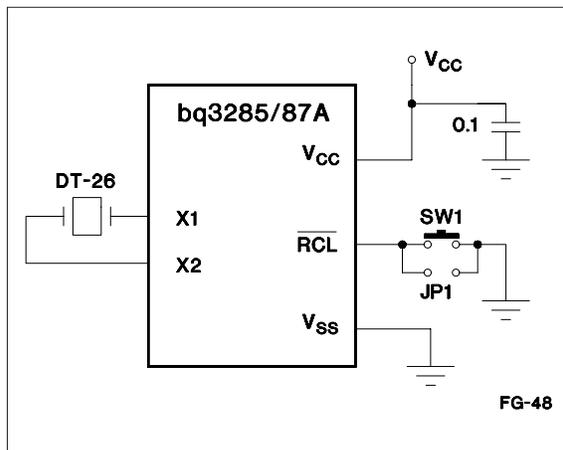


Figure 1. Recommended Hookup for RAM Clear Function

2. Clear the RAM: Jumper JP1.
3. Remove the JP1 jumper.

Implementation Differences

Although the hardware requirements for activating the Dallas Semiconductor RAM clear pin, \overline{RCLR} , are identical to those for activating the Benchmarq RCL pin, the function is implemented differently:

- Dallas Semiconductor's RAM clear function provides access to the internal lithium power source.
Shorting \overline{RCLR} to ground drains the lithium cell.
- Benchmarq's \overline{RCL} pin is internally de-bounced (oscillator on).
- Benchmarq's \overline{RCL} pin is active when power is on.

Benchmarq Advantages

The Benchmarq RTCs have the following advantages over the Dallas Semiconductor parts:

1. When the Dallas Semiconductor \overline{RCLR} pin is exposed to any low-impedance path including metal trays, conductive bags, conductive foam, ground, etc., the battery will be drained. This may severely limit the battery life of the RTC. The battery in the Benchmarq RTC will not be drained.
2. The Dallas Semiconductor RTC is prone to inadvertent clearing of RAM while the system is off because the RAM clear function is active when power is not valid.
3. The de-bouncing capability of the Benchmarq RTC prevents inadvertent clearing of the CMOS RAM as a result of spurious noise on the RCL pin.

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