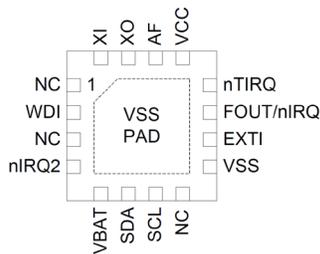




Artasia Real-Time Clock - AM0805

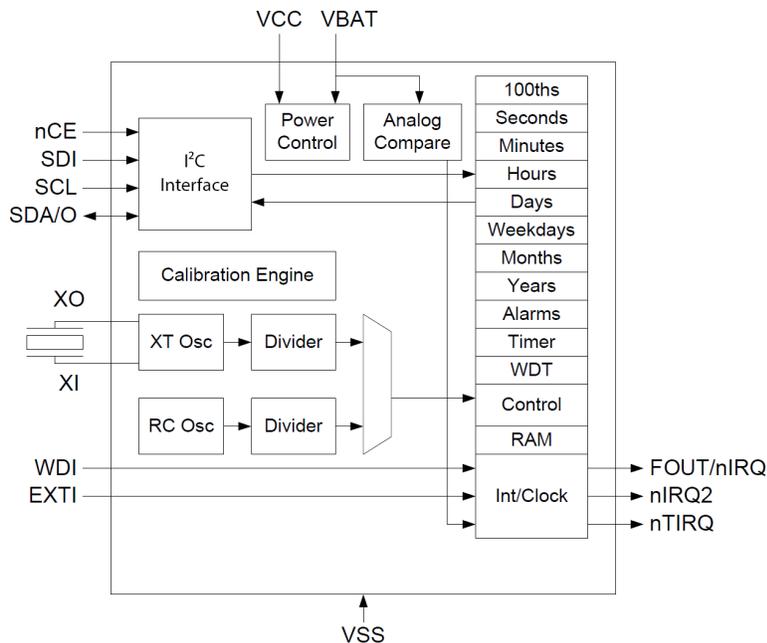
Product Brief

The Ambiq® Artasia Real-Time Clock AM0805 provides a groundbreaking combination of ultra-low power coupled with a highly sophisticated feature set. With power requirements significantly lower than any other industry RTC (as low as 14 nA), these are the first semiconductors based on Ambiq's innovative SPOT® (Subthreshold Power Optimized Technology) CMOS platform.



Pin Configuration Diagram for Ambiq Artasia RTC - AM0805

The AM0805 includes on-chip oscillators to provide minimum power consumption, full RTC functions including battery backup and programmable counters and alarms for timer and watchdog functions, and an I²C serial interface for communication with a host controller.



Detailed Functional Block Diagram for Ambiq Artasia RTC - AM0805



Ambiq Artasia RTC - AM0805AQ

Feature Highlights:

- Serves as a full function RTC for host processors such as microcontrollers.
- Includes three distinct feature groups: 1) baseline timekeeping, 2) advanced timekeeping, and 3) basic power management.
- Baseline timekeeping feature group supports the standard 32.786 kHz crystal (XT) oscillation mode for maximum frequency accuracy with an ultra-low current draw of 55 nA.
- Advanced timekeeping feature group supports two additional oscillation modes: 1) RC oscillator mode, and 2) Autocalibration mode.
- A proprietary calibration algorithm allows the AM0805 to digitally tune the RC oscillator frequency and the XT oscillator frequency with accuracy as low as 2 ppm at a given temperature.
- Power management features built into the AM0805 enable it to operate as a backup device in both linepowered and battery-powered systems.

Features and Specifications

Ultra-Low Supply Current

- 14 nA with RC oscillator
- 22 nA with RC oscillator and Autocalibration
- 55 nA with crystal oscillator

Baseline Timekeeping

- 4x GPIO Outputs
- 32.768 kHz crystal oscillator with integrated load capacitor/resistor
- Counters for hundredths, seconds, minutes, hours, date, month, year, century, and weekday
- Alarm capability on all counters
- Programmable output clock generation (32.768 kHz to 1 year)
- Countdown timer with repeat function
- Automatic leap year calculation

Advanced Timekeeping

- Advanced crystal calibration to ± 2 ppm
- Advanced RC calibration to ± 16 ppm
- Automatic calibration of RC oscillator to crystal oscillator
- Watchdog timer with hardware reset
- 256 bytes of general purpose RAM

Power Management

- Automatic switchover to Voltage of the Battery (VBAT)
- External interrupt monitor
- Programmable low battery detection threshold
- Programmable analog voltage comparator

Ultra-low Power Flexible Serial Peripherals

- I²C (up to 400 kHz) serial interface

Wide Operating Range

- Operating Voltage: 1.5-3.6 V,
- Clock and RAM Retention Voltage: 1.5-3.6 V
- Operating Temperature: -40°C to 85°C
- All inputs include Schmitt Triggers

Applications

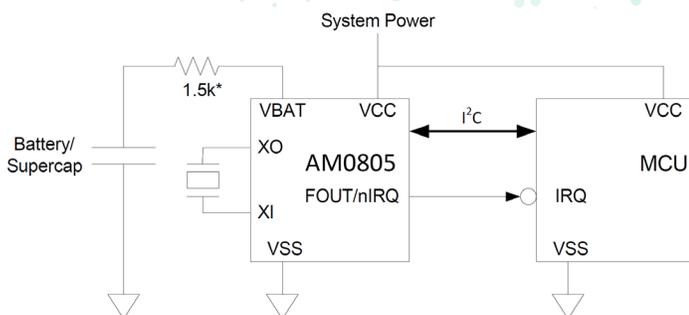
- Smart Cards
- Wireless Sensors and Tags
- Medical Electronics
- Utility Meters
- Data Loggers
- Appliances
- Handsets
- Consumer Electronics
- Consumer Equipment

Package Option

- 3 mm x 3 mm 16-pin QFN package

Ordering Information

- AM0805AQ
- AM1805I2CEVB (EVB)



* Total battery series impedance = 1.5k ohms, which may require an external resistor

Typical Application Circuit for AM0805

Product images shown are for illustration purposes only and may not be an exact representation of the products.



www.ambiq.com
sales@ambiq.com
+1 (512) 879-2850

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